

ACCOUNTING

- Determination Of Optimum Conductor Size, Oct. 15, page 66
- How Utility Solved Graphic Information Handling, Feb. 1, page 34
- Mechanization Speeds Customer Service, Nov. 15, page 70
- Modern Data Processing Equipment Helps Lower Electric Rates In N. Y., Feb. 1, page 29
- Overhead Line Labor Distribution The Easy Way, Dec. 1, page 52
- Revamped System Eliminates 100 Tons Of Records At KCP&L, Oct. 15, page 51
- Wide, Straight Transmission R/W Is Often Least Costly, Feb. 1, page 42

AREA DEVELOPMENT

- Colorful Past Marks Edison's Newly-Assigned Desert Territory, Sept. 1, page 47
- Pakistan Pushes Power Development, Oct. 1, page 64
- Plant Dedication Adds New Dimension To Utility-Community Relations, Sept. 15, page 56

AUTOMATION

- Computer Control Promises Cut In Generation Costs, Oct. 1, page 56
- Control And Interlocking Of Large Gas-Fired Boiler-Turbine-Generator Units, July 1, page 46
- Mechanization Speeds Customer Service, Nov. 15, page 70
- One Approach To Logging Of Steam-Station Performance, Dec. 1, page 48
- Puerto Rican Plant Tries ADP System, Dec. 15, page 66
- Remote Outage Locators After Three Years, Sept. 15, page 68

BUS DESIGN

- 138-Kv Substation Redesign Brings Installation \$ Down, Sept. 15, page 60
- Positive Planning In Distribution, Mar. 15, page 69

CABLES

- Chart Simplifies Sag Computations, Apr. 15, page 86
- Cornell EHV Cable Tests Pass Milestone, July 1, page 51
- Determination Of Optimum Conductor Size, Oct. 15, page 66
- Directly-Buried Cables Cooled By Water—Capacity Up 50%, Oct. 15, page 54
- Epoxy Gas Blocks Simplify Cable Pressurization Program, Feb. 1, page 41
- How PEPCO Moved Two 69-kv Pipe-Type Cables, Nov. 15, page 86
- Pressure Filling Process Does Better Pot-head Job, Dec. 1, page 46

CAPACITORS

- Five Years Experience With Secondary Capacitors In Series With Distribution Transformers, Feb. 15, page 77
- Series Capacitors On 12-Kv Feeders—An 11-Year Record, Apr. 1, page 56
- System Application And Control Of Kilovars, July 15, page 62

COMMUNICATIONS

- Economic Pool Dispatch Without Central Control, Sept. 1, page 43
- Epoxy Gas Blocks Simplify Cable Pressurization Program, Feb. 1, page 41
- Microwave Distance Measurements Speed Transmission Surveys, Feb. 15, page 80
- Mobile Radio's Arms Extended By Technology, Rule Changes, May 15, page 106
- Remote Outage Locators After Three Years, Sept. 15, page 68
- The Employee Information Conference—One Way To Improve Employee And Public Relations, Mar. 1, page 55
- Why Industry Meetings?, Mar. 1, page 52

COMPUTERS

- Computer Automatically Assembles All Fault-Card Data, Apr. 15, page 76
- Computer Control Promises Cut In Generation Costs, Oct. 1, page 56

ELECTRIC LIGHT AND POWER

Annual Index

Index to Volume 38, January-December, 1960

- Digital Computer Enhances Distribution System Control, Jan. 1, page 46
- Economic Conductor Sizes For Transmission Lines, June 1, page 58
- Modern Data Processing Equipment Helps Lower Electric Rates In N. Y., Feb. 1, page 29
- One Approach To Logging Of Steam-Station Performance, Dec. 1, page 48
- Puerto Rican Plant Tries ADP System, Dec. 15, page 66

CONSTRUCTION

- A 230-Kv Innovation—Metal Crossarms On H-Frame Line, Apr. 15, page 81
- America's First Kilowatt Turnpike Operating At 460-Kv, Dec. 15, page 56
- Are We Grounding For Least Possible Hazard?, Apr. 15, page 88
- Distribution System Improvements Reduce Storm Damage, Expedite Restoration, Oct. 15, page 69
- Economical Footing Design For Transmission Towers, Mar. 15, page 79
- EL&P Construction Forecast, Jan. 15, page 74
- Epoxy Gas Blocks Simplify Cable Pressurization Program, Feb. 1, page 41
- Good Structural Practices, Not Pounds, Should Dictate Transmission Tower Design, Oct. 1, page 62
- Helicopters Help Build 12-Kv Grand Canyon Line, Jan. 1, page 50
- How PEPCO Moved Two 69-Kv Pipe-Type Cables, Nov. 15, page 86
- How To Make Better Use Of Right-Of-Way Space, June 1, page 62
- Improved Specifications?—Here's "Why" And "How," Mar. 15, page 74
- Light Helicopter—Versatile Utility Tool, June 15, page 96
- Microwave Distance Measurements Speed Transmission Surveys, Feb. 15, page 80
- Nicaragua Builds Unified Power System, Feb. 15, page 82
- Overhead Line Labor Distribution The Easy Way, Dec. 1, page 52
- Planning Utility Office Space To Meet Future Needs, Dec. 1, page 39
- Pole Replacement The Hard Way, Mar. 15, page 84
- Radiography Checks Welds In Pipe-Type Cable Lines, Jan. 1, page 52
- The Case For Residential Underground, Nov. 1, page 42
- The Contractor's Obligation In Safety, Apr. 1, page 66
- 13-Kv Versus 4-Kv Distribution—Which Is Best?, Dec. 1, page 43
- Wide, Straight Transmission R/W Is Often Least Costly, Feb. 1, page 42
- Wire Shielding 230-Kv Line Carries Power To Isolated Area, July 15, page 67

CONTROL

- Computer Control Promises Cut In Generation Costs, Oct. 1, page 56
- Control And Interlocking Of Large Gas-Fired Boiler-Turbine-Generator Units, July 1, page 46
- Digital Computer Enhances Distribution System Control, Jan. 1, page 46
- 'Phone Call Starts Britain's First Automatic Peaking Station, May 15, page 102
- Puerto Rican Plant Tries ADP System, Dec. 15, page 66

DISPATCHING

- Economic Combination Of Units For Weekend Loads, Apr. 1, page 61
- Economic Pool Dispatch Without Central Control, Sept. 1, page 43

- Puerto Rican Plant Tries ADP System, Dec. 15, page 66

DISTRIBUTION

- Colorful Past Marks Edison's Newly-Assigned Desert Territory, Sept. 1, page 47
 - Digital Computer Enhances Distribution System Control, Jan. 1, page 46
 - Distribution Line Maintenance Program Proves Effective, Nov. 15, page 74
 - Distribution System Improvements Reduce Storm Damage, Expedite Restoration, Oct. 15, page 69
 - Economic Conductor Sizes For Transmission Lines, June 1, page 58
 - Evaluation Of Distribution Transformer Losses And Loss Ratios, July 15, page 56
 - Feeder Voltage Calculations, Sept. 15, page 64
 - Five Years Experience With Secondary Capacitors In Series With Distribution Transformers, Feb. 15, page 77
 - Graph Simplifies Determination Of Economic Conductor Size, Sept. 15, page 66
 - Helicopters Help Build 12-Kv Grand Canyon Line, Jan. 1, page 50
 - How Con Ed Cuts Fault-Locating Costs 50%, Nov. 1, page 41
 - How To Make Better Use Of Right-Of-Way Space, June 1, page 62
 - Modernizing College Distribution System Pays Surprising Dividends, Aug. 1, page 68
 - Nicaragua Builds Unified Power System, Feb. 15, page 82
 - Painting Transformers In Place Cuts Cost 40%, Apr. 15, page 84
 - Pakistan Pushes Power Development, Oct. 1, page 64
 - Pole Replacement The Hard Way, Mar. 15, page 84
 - Positive Planning In Distribution, Mar. 15, page 69
 - Pressure Filling Process Does Better Pot-head Job, Dec. 1, page 46
 - Radiography Checks Welds In Pipe-Type Cable Lines, Jan. 1, page 52
 - Remote Outage Locators After Three Years, Sept. 15, page 68
 - Residential Underground Gaining Acceptance On PGE System, Aug. 15, page 58
 - Series Capacitors On 12-Kv Feeders—An 11-Year Record, Apr. 1, page 56
 - Silicon Rectifiers Supplement D-C Network Load, Feb. 15, page 74
 - Single-Pole Disconnect Switch Tests Determine Looped-Circuit Break Capacity, Sept. 15, page 71
 - Special Design Characterizes Terminals For Distribution Transformers, Sept. 1, page 52
 - System Application And Control Of Kilovars, July 15, page 62
 - The Case For Residential Underground, Nov. 1, page 42
 - 13-Kv Versus 4-Kv Distribution—Which Is Best?, Dec. 1, page 43
 - Underfrequency Relays Speed Load Recovery, May 15, page 97
 - When To Treat Southern Pine Poles, Sept. 1, page 50
 - Why System Measurement Is Important, May 1, page 46
- ## ELECTRIC HEATING
- Characteristics Of Electric Heating Loads In The Cleveland Area, Mar. 1, page 58
 - EL&P Construction Forecast, Jan. 15, page 74
 - EL&P Thirty-first Major Appliance Survey, Aug. 1, page 54

Electric Heating Will Cut Costs Of New Nurses Home, Feb. 1, page 36
 Heating With Light, Aug. 1, page 71
 How Rate Improvement Ups Appliance Sales, Aug. 1, page 84
 Montreal's Approach To Space-Heating Rates, Nov. 1, page 36
 U. S. Savings And Loan League Reports: What Key Lending Officers Think Of Electric Heating, Oct. 1, page 52

EMPLOYEE RELATIONS

Ebasco's Seminar In Public Utility Safety, Nov. 1, page 37
 Overhead Line Labor Distribution The Easy Way, Dec. 1, page 52
 Planning Utility Office Space To Meet Future Needs, Dec. 1, page 39
 The Employee Information Conference—One Way To Improve Employee And Public Relations, Mar. 1, page 55
 Why Industry Meetings?, Mar. 1, page 52

FINANCING

U. S. Savings and Loan League Reports: What Key Lending Officers Think Of Electric Heating, Oct. 1, page 52

FOREIGN PRACTICES

Electricity Boon To Saw Mill Deep In Bush, May 1, page 56
 Model Testing At Sweden's Alvkärleby Hydraulic Laboratory, July 1, page 39
 Nicaragua Builds Unified Power System, Feb. 15, page 82
 Pakistan Pushes Power Development, Oct. 1, page 64
 Phone Call Starts Britain's First Automatic Peaking Station, May 15, page 102
 "V"-Towers Carry Million HP Through Canadian Wilds, May 1, page 50

FUELS

Electric Power By Unconventional Methods Of Energy Conversion, Oct. 15, page 60
 Nuclear Power—The Role Of The Consulting Engineer, Apr. 1, page 52
 One Approach To Logging Of Steam-Station Performance, Dec. 1, page 48

GENERATION

Changing Factors In Utility Boiler Design, July 15, page 52
 Computer Control Promises Cut In Generation Costs, Oct. 1, page 56
 Control And Interlocking Of Large Gas-Fired Boiler-Turbine-Generator Units, July 1, page 46
 Critical Problem Solved In Steam-Heat Distribution, Nov. 1, page 49
 Economic Combination Of Units For Weekend Loads, Apr. 1, page 61
 Economic Pool Dispatch Without Central Control, Sept. 1, page 43
 Economies Of Gas Turbine For Peaking, June 15, page 102
 EL&P Construction Forecast, Jan. 15, page 74
 Electric Power By Unconventional Methods Of Energy Conversion, Oct. 15, page 60
 Fish-Bypass Experience At PGE's New Hydro Projects, Mar. 1, page 62
 Model Testing At Sweden's Alvkärleby Hydraulic Laboratory, July 1, page 39
 Nicaragua Builds Unified Power System, Feb. 15, page 82
 Nuclear Power—The Role Of The Consulting Engineer, Apr. 1, page 52
 One Approach To Logging Of Steam-Station Performance, Dec. 1, page 48
 Pakistan Pushes Power Development, Oct. 1, page 64
 Peak-Load Energy At Low Incremental Cost, Aug. 15, page 50
 Phone Call Starts Britain's First Automatic Peaking Station, May 15, page 102
 Plant Dedication Adds New Dimension To Utility-Community Relations, Sept. 15, page 56
 Power Station Vulnerability To Nuclear Blast, Feb. 15, page 66

Program For Planning, Part V, Model Shows Generating Capacity Available, Feb. 15, page 69
 Program For Planning, Part VI, Simulated Reserve Margins Show Generation Capacity Needs, May 1, page 52
 Puerto Rican Plant Tries ADP System, Dec. 15, page 66
 Underfrequency Relays Speed Load Recovery, May 15, page 97

LIGHTING

Controlled Cooling Boosts Outdoor Fluorescent Lamp Output, May 15, page 92
 Heating With Light, Aug. 1, page 71
 Ultrasonic Cleaning Brightens Street Light Globes, Nov. 15, page 84

LOAD BUILDING

Building Load With Dehumidifiers, Aug. 1, page 66
 Characteristics Of Electric Heating Loads In The Cleveland Area, Mar. 1, page 58
 EL&P Construction Forecast, Jan. 15, page 74
 EL&P Thirty-first Major Appliance Survey, Aug. 1, page 54
 Electric Heating Will Cut Costs Of New Nurses Home, Feb. 1, page 36
 Electricity Takes Over In Heating Caustic Solution, Sept. 1, page 40
 Electric Range Promotion Sells 2138 Ranges, Aug. 1, page 88
 Electricity Boon To Saw Mill Deep In Bush, May 1, page 56
 Electricity vs. Gas For Commercial Kitchens—Which Is Best?, June 1, page 53
 Heating With Light, Aug. 1, page 71
 How Connecticut Utility Sells Private Street Lighting, Aug. 1, page 74
 How Market Surveys Can Help Dealers Sell, Aug. 15, page 46
 How Rate Improvement Ups Appliance Sales, Aug. 1, page 84
 Modernizing College Distribution System Pays Surprising Dividends, Aug. 1, page 68
 Sales Training Refresher Pays Off at NPSI, Dec. 15, page 51
 Selling In The Sizzling Sixties, July 15, page 42
 "Time To Change" Campaign Replaces 1304 Flame-Type Appliances, Aug. 1, page 78
 U. S. Savings And Loan League Reports: What Key Lending Officers Think Of Electric Heating, Oct. 1, page 52
 Utility Teams Up With Textile Firm To Boost Power Use, Sept. 15, page 58
 Whose Responsibility Is Appliance Servicing?, Aug. 1, page 81

MAINTENANCE

Are We Grounding For Least Possible Hazard?, Apr. 15, page 88
 Computer Automatically Assembles All Fault-Card Data, Apr. 15, page 76
 Cupro-Nickle Sheathing Prevents Marine Borer Attack—Triple Pole Life Expected, Oct. 1, page 68
 Distribution Line Maintenance Program Proves Effective, Nov. 15, page 74
 Distribution System Improvements Reduce Storm Damage, Expedite Restoration, Oct. 15, page 69
 Do-It-Yourself Meter Test Console, May 15, page 110
 Epoxy Gas Blocks Simplify Cable Pressurization Program, Feb. 1, page 41
 How AEP Maintains 345-Kv Live Lines, Oct. 15, page 58
 How PEPCO Moved Two 69-Kv Pipe-Type Cables, Nov. 15, page 86
 Light Helicopter—Versatile Utility Tool, June 15, page 96
 Live-Line Maintenance With Bare Hands—Cuts Man-hours And Hazards, Dec. 15, page 62
 New Chemical For Right-Of-Way Brush Control Proves Effective, Economical, Nov. 1, page 46

Overhead Line Labor Distribution The Easy Way, Dec. 1, page 52
 Painting Transformers In Place Cuts Cost 40%, Apr. 15, page 84
 Pole Replacement The Hard Way, Mar. 15, page 84
 Pressure Filling Process Does Better Pot-head Job, Dec. 1, page 46
 Radiography Checks Welds In Pipe-Type Cable Lines, Jan. 1, page 52
 Silicon Rectifiers Supplement D-C Network Load, Feb. 15, page 74
 Telemetry Tool Probes Audible Noise From 345-Kv Line, Feb. 1, page 38
 The Contractor's Obligation In Safety, Apr. 1, page 66
 13-Kv Versus 4-Kv Distribution—Which Is Best?, Dec. 1, page 43
 Ultrasonic Cleaning Brightens Street Light Globes, Nov. 15, page 84
 Versatile Mobile Test Truck Saves \$5000 Per Year, Aug. 15, page 55
 When To Treat Southern Pine Poles, Sept. 1, page 50

MANAGEMENT

Ebasco's Seminar In Public Utility Safety, Nov. 1, page 37
 EEI Convention Report, June 15, page 79
 EL&P Construction Forecast, Jan. 15, page 74
 EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
 How Utility Solved Graphic Information Handling, Feb. 1, page 34
 Improved Specifications?—Here's "Why" And "How," Mar. 15, page 74
 Overhead Line Labor Distribution The Easy Way, Dec. 1, page 52
 Planning Utility Office Space To Meet Future Needs, Dec. 1, page 39
 Sales Training Refresher Pays Off At NPSI, Dec. 15, page 51
 The Employee Information Conference—One Way To Improve Employee And Public Relations, Mar. 1, page 55
 Why Industry Meetings?, Mar. 1, page 52

METERING

Do-It-Yourself Meter Test Console, May 15, page 110
 Why System Measurement Is Important, May 1, page 46

NUCLEAR POWER

Nuclear Power—The Role Of The Consulting Engineer, Apr. 1, page 52

OPERATION

America's First Kilowatt Turnpike Operating At 460-Kv, Dec. 15, page 56
 Are We Grounding For Least Possible Hazard?, Apr. 15, page 88
 Chart Simplifies Sag Computations, Apr. 15, page 86
 Computer Automatically Assembles All Fault-Card Data, Apr. 15, page 76
 Computer Control Promises Cut In Generation Costs, Oct. 1, page 56
 Control And Interlocking Of Large Gas-Fired Boiler-Turbine-Generator Units, July 1, page 46
 Determination Of Optimum Conductor Size, Oct. 15, page 66
 Distribution System Improvements Reduce Storm Damage, Expedite Restoration, Oct. 15, page 69
 Economic Combination Of Units For Weekend Loads, Apr. 1, page 61
 Economic Pool Dispatch Without Central Control, Sept. 1, page 43
 Epoxy Gas Blocks Simplify Cable Pressurization Program, Feb. 1, page 41
 Evaluation Of Distribution Transformer Losses And Loss Ratios, July 15, page 56
 Fish-Bypass Experience At PGE's New Projects, Mar. 1, page 62
 Five Years Experience With Secondary Capacitors In Series With Distribution Transformers, Feb. 15, page 77

Helicopters Help Build 12-Kv Grand Canyon Line, Jan. 1, page 50
 How AEP Maintains 345-Kv Live Lines, Oct. 15, page 58
 How Con Ed Cuts Fault-Locating Costs 50%, Nov. 1, page 41
 How PEPCO Moved Two 69-Kv Pipe-Type Cables, Nov. 15, page 86
 How Utility Solved Graphic Information Handling, Feb. 1, page 34
 Light Helicopter—Versatile Utility Tool, June 15, page 96
 Live-line Maintenance With Bare Hands—Cuts Man-hours And Hazards, Dec. 15, page 62
 Mobile Radio's Arms Extended By Technology, Rule Changes, May 15, page 106
 New Chemical For Right-Of-Way Brush Control Proves Effective, Economical, Nov. 1, page 46
 New Considerations In Short Circuit Calculations, Jan. 1, page 55
 Overhead Line Labor Distribution The Easy Way, Dec. 1, page 52
 Peak-Load Energy At Low Incremental Cost, Aug. 15, page 50
 Pole Replacement The Hard Way, Mar. 15, page 84
 Power Station Vulnerability To Nuclear Blast, Feb. 15, page 66
 Pressure Filling Process Does Better Pot-head Job, Dec. 1, page 46
 Radiography Checks Welds In Pipe-Type Cable Lines, Jan. 1, page 52
 Remote Outage Locators After Three Years, Sept. 15, page 68
 Series Capacitors On 12-Kv Feeders—An 11-Year Record, Apr. 1, page 56
 Silicon Rectifiers Supplement D-C Network Load, Feb. 15, page 74
 Single-Pole Disconnect Switch Tests Determine Looped-Circuit Break Capacity, Sept. 15, page 71
 System Application And Control Of Kilovars, July 15, page 62
 Telemetry Tool Probes Audible Noise From 345-Kv Line, Feb. 1, page 38
 13-Kv Versus 4-Kv Distribution—Which Is Best?, Dec. 1, page 43
 Versatile Mobile Test Truck Saves \$5000 Per Year, Aug. 15, page 55
 Vibration Problems Plague Rural Lines, Nov. 15, page 78
 When To Treat Southern Pine Poles, Sept. 1, page 50
 Wide, Straight Transmission R/W Is Often Least Costly, Feb. 1, page 42
 Wire Shielding 230-Kv Line Carries Power To Isolated Area, July 15, page 67

PERSONNEL

Ebasco's Seminar In Public Utility Safety, Nov. 1, page 37
 Live-line Maintenance With Bare Hands—Cuts Man-hours And Hazards, Dec. 15, page 62
 Overhead Line Labor Distribution The Easy Way, Dec. 1, page 52
 Planning Utility Office Space To Meet Future Needs, Dec. 1, page 39
 Sales Training Refresher Pays Off At NPSI, Dec. 15, page 51
 The Employee Information Conference—One Way To Improve Employee And Public Relations, Mar. 1, page 55
 Why Industry Meetings?, Mar. 1, page 52

PLANT DESIGN

Changing Factors In Utility Boiler Design, July 15, page 52
 Computer Control Promises Cut In Generation Costs, Oct. 1, page 56
 Nicaragua Builds Unified Power System, Feb. 15, page 82
 One Approach To Logging Of Steam-Station Performance, Dec. 1, page 48
 Peak-Load Energy At Low Incremental Cost, Aug. 15, page 50
 Power Station Vulnerability To Nuclear Blast, Feb. 15, page 66

Puerto Rican Plant Tries ADP System, Dec. 15, page 66

POLES

A 230-Kv Innovation—Metal Crossarms On H-Frame Line, Apr. 15, page 81
 America's First Kilowatt Turnpike Operating At 460-Kv, Dec. 15, page 56
 Cupro-Nickel Sheathing Prevents Marine Borer Attack—Triple Pole Life Expected, Oct. 1, page 68
 Distribution Line Maintenance Program Proves Effective, Nov. 15, page 74
 Pole Replacement The Hard Way, Mar. 15, page 84
 When To Treat Southern Pine Poles, Sept. 1, page 50
 Wire Shielding 230-Kv Line Carries Power To Isolated Area, July 15, page 67

PUBLIC RELATIONS

Helicopters Help Build 12-Kv Grand Canyon Line, Jan. 1, page 50
 Microwave Distance Measurements Speed Transmission Surveys, Feb. 15, page 80
 Plant Dedication Adds New Dimension To Utility-Community Relations, Sept. 15, page 56
 Sales Training Refresher Pays Off At NPSI, Dec. 15, page 51
 The Employee Information Conference—One Way To Improve Employee And Public Relations, Mar. 1, page 55

RATES

How Rate Improvement Ups Appliance Sales, Aug. 1, page 84
 Modern Data Processing Equipment Helps Lower Electric Rates In N.Y., Feb. 1, page 29
 Montreal's Approach To Space-Heating Rates, Nov. 1, page 36

REGULATION, VOLTAGE

Five Years Experience With Secondary Capacitors In Series With Distribution Transformers, Feb. 15, page 77
 Series Capacitors On 12-Kv Feeders—An 11-Year Record, Apr. 1, page 56

REGULATORY MATTERS

Mobile Radio's Arms Extended By Technology, Rule Changes, May 15, page 106
 Remote Outage Locators After Three Years, Sept. 15, page 68

RELAYING

Underfrequency Relays Speed Load Recovery, May 15, page 97

RESEARCH

Characteristics Of Electric Heating Loads In The Cleveland Area, Mar. 1, page 58
 Controlled Cooling Boosts Outdoor Fluorescent Lamp Output, May 15, page 92
 Cornell EHV Cable Tests Pass Milestone, July 1, page 51
 Cupro-Nickel Sheathing Prevents Marine Borer Attack—Triple Pole Life Expected, Oct. 1, page 68
 Model Testing At Sweden's Alvkärlaby Hydraulic Laboratory, July 1, page 39
 NSP's "Galloping Tester" Proves Suspension Insulators Are Rugged!, June 15, page 107
 Power Station Vulnerability To Nuclear Blast, Feb. 15, page 66
 Single-Pole Disconnect Switch Tests Determine Looped-Circuit Break Capacity, Sept. 15, page 71
 Vibration Problems Plague Rural Lines, Nov. 15, page 78

RIGHT-OF-WAY

America's First Kilowatt Turnpike Operating At 460-Kv, Dec. 15, page 56
 How To Make Better Use Of Right-Of-Way Space, June 1, page 62
 Microwave Distance Measurements Speed Transmission Surveys, Feb. 15, page 80
 New Chemical For Right-Of-Way Brush Control Proves Effective, Economical, Nov. 1, page 46

Pole Replacement The Hard Way, Mar. 15, page 84

"V"-Towers Carry Million HP Through Canadian Wilds, May 1, page 50
 Wide, Straight Transmission R/W Is Often The Least Costly, Feb. 1, page 42

RURAL SERVICE

EL&P Construction Forecast, Jan. 15, page 74
 Electricity Boon To Saw Mill Deep In Bush, May 1, page 56
 Vibration Problems Plague Rural Lines, Nov. 15, page 78

SAFETY

Are We Grounding For Least Possible Hazard?, Apr. 15, page 88
 Ebasco's Seminar In Public Utility Safety, Nov. 1, page 37
 Live-line Maintenance With Bare Hands—Cuts Man-hours And Hazards, Dec. 15, page 62
 Power Station Vulnerability To Nuclear Blast, Feb. 15, page 66
 The Contractor's Obligation In Safety, Apr. 1, page 66

STREET LIGHTING

Controlled Cooling Boosts Outdoor Fluorescent Lamp Output, May 15, page 92
 Distribution Line Maintenance Program Proves Effective, Nov. 15, page 74
 EL&P Construction Forecast, Jan. 15, page 74
 Ultrasonic Cleaning Brightens Street Light Globes, Nov. 15, page 84

SUBSTATIONS

America's First Kilowatt Turnpike Operating At 460-Kv, Dec. 15, page 56
 Colorful Past Marks Edison's Newly-Assigned Desert Territory, Sept. 1, page 47
 New Considerations In Short Circuit Calculations, Jan. 1, page 55
 138-Kv Substation Redesign Brings Installation \$ Down, Sept. 15, page 60
 Positive Planning In Distribution, Mar. 15, page 69
 Silicon Rectifiers Supplement D-C Network Load, Feb. 15, page 74

SYSTEM PLANNING

America's First Kilowatt Turnpike Operating At 460-Kv, Dec. 15, page 56
 Determination Of Optimum Conductor Size, Oct. 15, page 66
 Digital Computer Enhances Distribution System Control, Jan. 1, page 46
 Evaluation Of Distribution Transformer Losses And Loss Ratios, July 15, page 56
 How To Make Better Use Of Right-Of-Way Space, June 1, page 62
 New Considerations In Short Circuit Calculations, Jan. 1, page 55
 Nicaragua Builds Unified Power System, Feb. 15, page 82
 Positive Planning In Distribution, Mar. 15, page 69
 Power Station Vulnerability To Nuclear Blast, Feb. 15, page 66
 Program For Planning, Part V, Model Shows Generating Capacity Available, Feb. 15, page 69
 Program For Planning, Part VI, Simulated Reserve Margins Show Generation Capacity Needs, May 1, page 52
 Residential Underground Gaining Acceptance On PGE System, Aug. 15, page 58
 The Case For Residential Underground, Nov. 1, page 42
 13-Kv Versus 4-Kv Distribution—Which Is Best?, Dec. 1, page 43
 Wide, Straight Transmission R/W Is Often Least Costly, Feb. 1, page 42

SYSTEM STUDIES

Economic Conductor Sizes For Transmission Lines, June 1, page 58
 Economies Of Gas Turbine For Peaking, June 15, page 102

New Considerations In Short Circuit Calculations, Jan. 1, page 55
Vibration Problems Plague Rural Lines, Nov. 15, page 78

TESTING

How Con Ed Cuts Fault-Locating Costs 50%, Nov. 1, page 41
NSP's "Galloping Tester" Proves Suspension Insulators Are Rugged!, June 15, page 107
Radiography Checks Welds In Pipe-Type Cable Lines, Jan. 1, page 52
Special Design Characterizes Terminals For Distribution Transformers, Sept. 1, page 52
Telemetry Tool Probes Audible Noise From 345-Kv Line, Feb. 1, page 38
Versatile Mobile Test Truck Saves \$5000 Per Year, Aug. 15, page 55

TRAINING

Live-line Maintenance With Bare Hands—Cuts Man-hours And Hazards, Dec. 15, page 62
Overhead Line Labor Distribution The Easy Way, Dec. 1, page 52
Sales Training Refresher Pays Off At NPSI, Dec. 15, page 51
The Employee Information Conference—One Way To Improve Employee And Public Relations, Mar. 1, page 55
Why Industry Meetings?, Mar. 1, page 52

TRANSFORMERS

America's First Kilowatt Turnpike Operating At 460-Kv, Dec. 15, page 56
Evaluation Of Distribution Transformer Losses And Loss Ratios, July 15, page 56
Five Years Experience With Secondary Capacitors In Series With Distribution Transformers, Feb. 15, page 77
How PEPCO Moved Its Largest Transformer, Mar. 15, page 72
Residential Underground Gaining Acceptance On PGE System, Aug. 15, page 58
Special Design Characterizes Terminals For Distribution Transformers, Sept. 1, page 52

TRANSMISSION

A 230-Kv Innovation—Metal Crossarms On H-Frame Line, Apr. 15, page 81
America's First Kilowatt Turnpike Operating At 460-Kv, Dec. 15, page 56
Are We Grounding For Least Possible Hazard?, Apr. 15, page 88
Chart Simplifies Sag Computations, Apr. 15, page 86
Colorful Past Marks Edison's Newly-Assigned Desert Territory, Sept. 1, page 47
Cornell EHV Cable Tests Pass Milestone, July 1, page 51
Directly-Buried Cables Cooled By Water—Capacity Up 50%, Oct. 15, page 54
Distribution System Improvements Reduce Storm Damage, Expedite Restoration, Oct. 15, page 69
Economic Conductor Sizes For Transmission Lines, June 1, page 58
Economical Footing Design For Transmission Towers, Mar. 15, page 79
Good Structural Practices, Not Pounds, Should Dictate Transmission Tower Design, Oct. 1, page 62
Graph Simplifies Determination Of Economic Conductor Size, Sept. 15, page 66
How AEP Maintains 345-Kv Live Lines, Oct. 15, page 58
How PEPCO Moved Its Largest Transformer, Mar. 15, page 72
How To Make Better Use Of Right-Of-Way Space, June 1, page 62
How Utility Solved Graphic Information Handling, Feb. 1, page 34
Live-line Maintenance With Bare Hands—Cuts Man-hours And Hazards, Dec. 15, page 62
Microwave Distance Measurements Speed Transmission Surveys, Feb. 15, page 80

New Chemical For Right-Of-Way Brush Control Proves Effective, Economical, Nov. 1, page 46
New Considerations In Short Circuit Calculations, Jan. 1, page 55
Nicaragua Builds Unified Power System, Feb. 15, page 82
138-Kv Substation Redesign Brings Installation \$ Down, Sept. 15, page 60
Pakistan Pushes Power Development, Oct. 1, page 64
Radiography Checks Welds In Pipe-Type Cable Lines, Jan. 1, page 52
Remote Outage Locators After Three Years, Sept. 15, page 68
Sag Computations By Two Slide Rules, Mar. 1, page 65
System Application And Control Of Kilovars, July 15, page 62
Telemetry Tool Probes Audible Noise From 345-Kv Line, Feb. 1, page 38
Underfrequency Relays Speed Load Recovery, May 15, page 97
"V"-Towers Carry Million HP Through Canadian Wilds, May 1, page 50
Vibration Problems Plague Rural Lines, Nov. 15, page 78
Why System Measurement Is Important, May 1, page 46
Wide, Straight, Transmission R/W Is Often Least Costly, Feb. 1, page 42
Wire Shielding 230-Kv Line Carries Power To Isolated Area, July 15, page 67

TRANSPORTATION

Helicopters Help Build 12-Kv Grand Canyon Line, Jan. 1, page 50
Light Helicopter—Versatile Utility Tool, June 15, page 96
Pole Replacement The Hard Way, Mar. 15, page 84
Versatile Mobile Test Truck Saves \$5000 Per Year, Aug. 15, page 55

UNDERGROUND

Cornell EHV Cable Tests Pass Milestone, July 1, page 51
Directly-Buried Cables Cooled By Water—Capacity Up 50%, Oct. 15, page 54
Epoxy Gas Blocks Simplify Cable Pressurization Program, Feb. 1, page 41
How Con Ed Cuts Fault-Locating Costs 50%, Nov. 1, page 41
How PEPCO Moved Two 69-Kv Pipe-Type Cables, Nov. 15, page 86
Pressure Filling Process Does Better Pot-head Job, Dec. 1, page 46
Residential Underground Gaining Acceptance On PGE System, Aug. 15, page 58
Silicon Rectifiers Supplement D-C Network Load, Feb. 15, page 74
The Case For Residential Underground, Nov. 1, page 42
Versatile Mobile Test Truck Saves \$5000 Per Year, Aug. 15, page 55

UTILITY MAN'S NOTEBOOK

February 1, page 44
February 15, page 85
March 1, page 73
April 15, page 91
May 15, page 113
July 15, page 70
August 15, page 64
September 15, page 72
October 15, page 72
November 1, page 50
December 1, page 65

AUTHORS

Allehoff, Fred A. and Delmar C. Johnson, Improved Specifications?—Here's "Why" And "How," Mar. 15, page 74
Althouse, James W., Jr., Do-It-Yourself Meter Test Console, May 15, page 110
Alvey, C. D., Computer Automatically Assembles All Fault-Card Data, Apr. 15, page 76
Anderson, D. B. and P. B. Ross, Supro-Nickel Sheathing Prevents Marine Borer Attack—Triple Pole Life Expected, Oct. 1, page 68

Andrews, D. L. and P. A. Oakes, Wire Shielding 230-Kv Line Carries Power To Isolated Area, July 15, page 67
Angelini, Stig, Model Testing At Sweden's Alvkärlby Hydraulic Laboratory, July 1, page 39
Antliff, J. C., Montreal's Approach To Space-Heating Rates, Nov. 1, page 36
Arena, J. R. and W. C. Freeman, Economical Footing Design For Transmission Towers, Mar. 15, page 79
Arena, J. R., Good Structural Practices, Not Pounds, Should Dictate Transmission Tower Design, Oct. 1, page 62
Argersinger, J. L., Changing Factors In Utility Boiler Design, July 15, page 52
Arnett, Howard, Why Industry Meetings?, Mar. 1, page 52
Baldwin, C. J. and J. E. Billings, Program For Planning, Part V, Model Shows Generating Capacity Available, Feb. 15, page 69
Baldwin, C. J. and C. H. Hoffman, Program For Planning, Part VI, Simulated Reserve Margins Show Generation Capacity Needs, May 1, page 52
Becker, Raymond A., Modern Data Processing Equipment Helps Lower Electric Rates In N. Y., Feb. 1, page 29
Benner, P. E., A. G. Mellor and J. B. McClure, Electric Power By Unconventional Methods Of Energy Conversion, Oct. 15, page 60
Bennett, R. R. and F. A. Ritchings, Peak-Load Energy At Low Incremental Cost, Aug. 15, page 50
Billings, J. E. and C. J. Baldwin, Program For Planning, Part V, Model Shows Generating Capacity Available, Feb. 15, page 69
Black, Paul M. and Jack C. Foss, 138-Kv Substation Redesign Brings Installation \$ Down, Sept. 15, page 60
Bosse, Laurent, Electricity Boon To Saw Mill Deep In Bush, May 1, page 56
Browder, Joe B., Heating With Light, Aug. 1, page 71
Byrne, W. L., Selling In The Sizzling Sixties, July 15, page 42
Cale, L. T. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
Carter, W. Price, How AEP Maintains 345-Kv Live Lines, Oct. 15, page 58
Colton, Rodney P., Overhead Line Labor Distribution The Easy Way, Dec. 1, page 52
Conn, L. A., New Chemical For Right-Of-Way Brush Control Proves Effective, Economical, Nov. 1, page 46
Crowell, Fred C., Five Years Experience With Secondary Capacitors In Series With Distribution Transformers, Feb. 15, page 77
Cumming, Robert H., Sag Computations By Two Slide Rules, Mar. 1, page 65
Curtis, T. E., Single-Pole Disconnect Switch Tests Determine Looped-Circuit Break Capacity, Sept. 15, page 71
Dana, George E., How Utility Solved Graphic Information Handling, Feb. 1, page 34
Davis, H. L., Jr., Radiography Checks Welds In Pipe-Type Cable Lines, Jan. 1, page 52
Dewberry, R. A., Feeder Voltage Calculations, Sept. 15, page 64
Dewberry, R. A., Determination Of Optimum Conductor Size, Oct. 15, page 66
Drumm, S. L. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
Dunn, Laurence A., Building Load With Dehumidifiers, Aug. 1, page 66
Eicher, George J., Fish-Bypass Experience At PGE's New Hydro Projects, Mar. 1, page 62
Figiel, F. J., How Con Ed Cuts Fault-Locating Costs 50%, Nov. 1, page 41
Finch, Edward H. and Ludwig Skog, Jr., Control And Interlocking Of Large Gas-Fired Boiler-Turbine-Generator Units, July 1, page 46
Flahie, Charles E., Positive Planning In Distribution, Mar. 15, page 69
Foss, Jack C. and Paul M. Black, 138-Kv Substation Redesign Brings Installation \$ Down, Sept. 15, page 60

- Freeman, W. C. and J. R. Arena, Economical Footing Design For Transmission Towers, Mar. 15, page 79
- Freisinger, E. G., Revamped System Eliminates 100 Tons Of Records At KCP&L, Oct. 15, page 51
- Gandy, Arthur, Jr., How PEPCO Moved Two 69-Kv Pipe-Type Cables, Nov. 15, page 86
- George, E. O. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Godoshian, Arthur and Roland Henderson, Pressure Filling Process Does Better Pot-head Job, Dec. 1, page 46
- Gohlke, A. C., Chart Simplifies Sag Computations, Apr. 15, page 86
- Gordon, R. H., Nuclear Power—The Role Of The Consulting Engineer, Apr. 1, page 52
- Gravatt, Howard R., Utility Teams Up With Textile Firm To Boost Power Use, Sept. 15, page 58
- Grindrod, J., 'Phone Call Starts Britain's First Automatic Peaking Station, May 15, page 102
- Griswold, A. S. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Gross, E. T. B. and D. B. Singer, Power Station Vulnerability To Nuclear Blast, Feb. 15, page 66
- Guidero, A. L., Computer Control Promises Cut In Generation Costs, Oct. 1, page 56
- Gunn, Paul L., The Employee Information Conference—One Way To Improve Employee And Public Relations, Mar. 1, page 55
- Hackler, John and John Lee, Electric Heating Will Cut Costs Of New Nurses Home, Feb. 1, page 36
- Hall, A. A., Jr., Distribution System Improvements Reduce Storm Damage, Expedite Restoration, Oct. 15, page 69
- Hall, T. H., Painting Transformers In Place Cuts Cost 40%, Apr. 15, page 84
- Harwood, William R., How Connecticut Utility Sells Private Street Lighting, Aug. 1, page 74
- Henderson, Roland and Arthur Godoshian, Pressure Filling Process Does Better Pot-head Job, Dec. 1, page 46
- Hesseman, Edward D., Characteristics Of Electric Heating Loads In The Cleveland Area, Mar. 1, page 58
- Hicks, Howard B., How Market Surveys Can Help Dealers Sell, Aug. 15, page 46
- Higginbotham, Gordon and James Ratkowski, Telemetry Tool Probes Audible Noise From 345-Kv Line, Feb. 1, page 38
- Hodel, Leslie E., A 230-Kv Innovation—Metal Crossarms On H-Frame Line, Apr. 15, page 81
- Hoffman, C. H. and C. J. Baldwin, Program For Planning, Part VI, Simulated Reserve Margins Show Generation Capacity Needs, May 1, page 52
- Iriarte, M., Jr., R. R. Ramirez and R. R. Tressler, Puerto Rican Plant Tries ADP System, Dec. 15, page 66
- Jack, Kimball and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Jacobs, Walter C., Planning Utility Office Space To Meet Future Needs, Dec. 1, page 39
- Jarman, Hugh A., "V"-Towers Carry Million HP Through Canadian Wilds, May 1, page 50
- Jeryan, P. H., Nicaragua Builds Unified Power System, Feb. 15, page 82
- Johnson, Delmar C. and Fred A. Allehoff, Improved Specifications—Here's "Why" And "How," Mar. 15, page 74
- Johnson, Wayne H., When To Treat Southern Pine Poles, Sept. 1, page 50
- Josberger, F. G., 13-Kv Versus 4-Kv Distribution—Which Is Best?, Dec. 1, page 43
- Keezer, D. C., Series Capacitors On 12-Kv Feeders—An 11-Year Record, Apr. 1, page 56
- Kimball, Fred M., Whose Responsibility Is Appliance Servicing?, Aug. 1, page 81
- Klein, Kenneth W., Evaluation Of Distribution Transformer Losses And Loss Ratios, July 15, page 56
- Lancaster, E. L., How To Make Better Use Of Right-Of-Way Space, June 1, page 62
- Lee, John and John Hackler, Electric Heating Will Cut Costs Of New Nurses Home, Feb. 1, page 36
- Lee, R. P. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Linder, L. L., Economic Pool Dispatch Without Central Control, Sept. 1, page 43
- Lindseth, E. L. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Lloyd, B. L. and J. O. Stephens, Economies Of Gas Turbine For Peaking, June 15, page 102
- Lyon, S. A., One Approach To Logging Of Steam-Station Performance, Dec. 1, page 48
- McClure, J. B., A. B. Mellor and P. E. Benner, Electric Power By Unconventional Methods Of Energy Conversion, Oct. 15, page 60
- McCormick, P. W. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- McCuen, R. L., Electricity vs Gas For Commercial Kitchens—Which Is Best?, June 1, page 53
- McDougall, E. J., Underfrequency Relays Speed Load Recovery, May 15, page 97
- MacDonald, R. G. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Martel, Andre, Electricity Takes Over In Heating Caustic Solution, Sept. 1, page 40
- Mellor, A. G., P. E. Benner and J. B. McClure, Electric Power By Unconventional Methods Of Energy Conversion, Oct. 15, page 60
- Naquin, A. J. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Nourse, W. B., Sales Training Refresher Pays Off At NOPSI, Dec. 15, page 51
- Oakes, C. E. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Oakes, P. A. and D. L. Andrews, Wire Shielding 230-Kv Line Carries Power To Isolated Area, July 15, page 67
- O'Shee, P. C., Why System Measurement Is Important, May 1, page 46
- Poffenberger, J. C., Vibration Problems Plague Rural Lines, Nov. 15, page 78
- Pollock, S. H., System Application And Control Of Kilovars, July 15, page 62
- Ralston, P. and G. H. West, Directly-Buried Cables Cooled By Water—Capacity Up 50%, Oct. 15, page 54
- Ramirez, R. R., M. Iriarte, Jr. and R. R. Tressler, Puerto Rican Plant Tries ADP System, Dec. 15, page 66
- Rankin, J. R. and C. I. Stillman, New Considerations In Short Circuit Calculations, Jan. 1, page 55
- Ratkowski, James and Gordon Higginbotham, Telemetry Tool Probes Audible Noise From 345-Kv Line, Feb. 1, page 38
- Rekoff, M. G., Jr., Graph Simplifies Determination Of Economic Conductor Size, Sept. 15, page 66
- Rhoten, G. P., Digital Computer Enhances Distribution System Control, Jan. 1, page 46
- Ritchings, F. A. and R. R. Bennett, Peak-Load Energy At Low Incremental Cost, Aug. 15, page 50
- Robertson, R. N., "Time To Change" Campaign Replaces 1034 Flame-Type Appliances, Aug. 1, page 78
- Rogers, W. T., The Contractor's Obligation In Safety, Apr. 1, page 66
- Rogers, W. T., Ebasco's Seminar In Public Utility Safety, Nov. 1, page 37
- Rorden, H. L., Are We Grounding For Least Possible Hazard, Apr. 15, page 88
- Rorden, Harold L., Live-line Maintenance With Bare Hands—Cuts Manhours And Hazards, Dec. 15, page 62
- Ross, P. B. and D. B. Anderson, Cupro-Nickel Sheathing Prevents Marine Borer Attack—Triple Pole Life Expected, Oct. 1, page 68
- Schepers, P. R. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Schmidt, William S., Economic Combination Of Units For Weekend Loads, Apr. 1, page 61
- Scott, Robert E., How PEPCO Moved Its Largest Transformer, Mar. 15, page 72
- Secrest, W. S., Electric Range Promotion Sells 2138 Ranges, Aug. 1, page 88
- Selden, Don R., and Erick P. Verheiden, Residential Underground Gaining Acceptance On PGE System, Aug. 15, page 58
- Senyard, W. H. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Shaw, Frank W., Wide, Straight Transmission R/W Is Often Least Costly, Feb. 1, page 42
- Shaw, Truman B., Special Design Characterizes Terminals For Distribution Transformers, Sept. 1, page 52
- Simpson, H. T. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33
- Sinclair, W. A., Versatile Mobile Test Truck Saves \$5000 Per Year, Aug. 15, page 55
- Singer, D. B. and E. T. B. Gross, Power Station Vulnerability To Nuclear Blast, Feb. 15, page 66
- Skog, Ludwig, Jr. and Edward H. Finch, Control And Interlocking Of Large Gas-Fired Boiler-Turbine-Generator Units, July 1, page 46
- Slothower, John C., Mobile Radio's Arms Extended By Technology, Rule Changes, May 15, page 106
- Slothower, John C., NSP's "Galloping Tester" Proves Suspension Insulators Are Rugged!, June 15, page 107
- Slothower, John C., Remote Outage Locators After Three Years, Sept. 15, page 68
- Small, Henry F., Economic Conductor Sizes For Transmission Lines, June 1, page 58
- Smith, Charles W., Silicon Rectifiers Supplement D-C Network Load, Feb. 15, page 74
- Smith, V. K., The Case For Residential Underground, Nov. 1, page 42
- Stephens, J. O. and B. L. Lloyd, Economies Of Gas Turbine For Peaking, June 15, page 102
- Stillman, C. I. and J. R. Rankin, New Considerations In Short Circuit Calculations, Jan. 1, page 55
- Stroud, H. A., How Rate Improvement Ups Appliance Sales, Aug. 1, page 84
- Strunk, Norman, U. S. Savings And Load League Reports: What Key Lending Officers Think Of Electric Heating, Oct. 1, page 52
- Svereika, George, Critical Problem Solved In Steam-Heat Distribution, Nov. 1, page 49
- Tressler, R. R., M. Iriarte, Jr. and R. R. Ramirez, Puerto Rican Plant Tries ADP System, Dec. 15, page 66
- Urner, M. J., Microwave Distance Measurements Speed Transmission Surveys, Feb. 15, page 80
- Van Dusen, H. A., Jr., Controlled Cooling Boosts Outdoor Fluorescent Lamp Output, May 15, page 92
- Verheiden, Eric P. and Don R. Selden, Residential Underground Gaining Acceptance On PGE System, Aug. 15, page 58
- Ware, Robert L., Distribution Line Maintenance Program Proves Effective, Nov. 15, page 74
- West, G. H. and P. Ralston, Directly-Buried Cables Cooled By Water—Capacity Up 50%, Oct. 15, page 54
- Wilson, Allen B., Mechanization Speeds Customer Service, Nov. 15, page 70
- Zimmer, Wm. H. and others, EL&P's Annual Management "Look-Ahead" By 15 Industry Leaders, Jan. 1, page 33

CALENDAR OF EVENTS

INDEX TO ADVERTISERS AND THEIR AGENCIES

December 13-15—Institute of Radio Engineers, 1960 Eastern Joint Computer Conference, Hotel New Yorker and Manhattan Center, New York, N. Y.

December 13—Electric Companies Public Information Program, Steering Committee Meeting, Edgewater Beach Hotel, Chicago, Ill.

December 13-14—National Safety Council, Public Utilities Section, Executive Committee Meeting, Statler Hilton Hotel, New York, N. Y.

December 15—Missouri Basin Inter-Agency Committee Meeting, Martin Hotel, Sioux City, Ia.

December 15-16—Edison Electric Institute, Residential Electric Heating and Air Conditioning Committee Meeting, Cincinnati, Ohio.

January 17-19, 1961—Instrument Society of America, Winter Instrument-Automation Conference and Exhibit, Sheraton-Jefferson Hotel and Kiel Auditorium, St. Louis, Mo.

January 19-20, 1961—Edison Electric Institute, Transmission and Distribution Committee, Warwick Hotel, Philadelphia, Pa.

January 23-27, 1961 — Doble Engineering Conference, Boston, Mass.

January 25-26, 1961—Southeastern Electric Exchange, Legal and Claims Committee Meeting, Miami Beach, Fla.

January 26-27, 1961—Pennsylvania Electric Association, Engineering Section, Communications Committee Meeting.

January 29-February 3, 1961—American Institute of Electrical Engineers, Winter General Meeting, Statler Hotel, New York, N. Y.

February 2-3, 1961 — Pennsylvania Electric Association, Prime Movers Committee.

February 5-7, 1961—National Association of Purchasing Agents, Public Utility Buyers Group, Statler Hilton Hotel, Detroit, Mich.

February 13-16, 1961—American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Annual Meeting and 15th International Heating and Air-Conditioning Exposition, International Amphitheatre, Chicago, Ill.

February 16-17, 1961—Pennsylvania Electric Association, Engineering Section, Electrical Equipment Committee, Pick-Roosevelt Hotel, Pittsburgh, Pa.

March 5-8—Third Annual Lighting Exposition, World Lighting Forum, New York Coliseum, New York, N. Y.

Acme Electric Corp.96
John Harder Fenstermacher Advg.

Air Preheater Corp.Inside Front Cover
G. M. Basford Co.

Allis-Chalmers Mfg. Co.,
Power Equipment Div.24, 25
Klau-Van Pietersom-Dunlap, Inc.

Aluminum Co. of America20, 21
Fuller & Smith & Ross, Inc.

American Bridge Div.,
United States Steel Corp.81, 82, 83, 84
Batten, Barton, Durstine & Osborn, Inc.

American Concrete Corp.42
The Griswold-Eshleman Co.

Bashlin Co., W. M.91
Davies & McKinney Advg.

Bethlehem Steel Co.26
Hazard Advg. Co., Inc.

Blackburn Corp., Jasper.....Inside Back Cover
Ridgway-Hirsch Advg. Co.

Burndy Corp.6
Ted Gravenston, Inc.

Copperweld Steel Co.,
Wire & Cable Div.13
Reuter & Bragdon, Inc.

DeLaval Separator Co.31
Marsteller, Rickard, Gebhardt & Reed, Inc.

Dow Corning Corp.80
Church & Guisewite Advg., Inc.

Electro-Motive Div.,
General Motors Corp.16, 17
Marsteller, Rickard, Gebhardt & Reed, Inc.

Fisher-Pierce Co.92
Culver Advg., Inc.

General Cable Corp.26
Hicks & Greist, Inc.

General Electric Co.,
Schenectady.....19, 32, 33, 87
George R. Nelson, Inc.

Haley & Co., R. G.77

Holan Corp.39
The Bayless-Kerr Co.

I-T-E Circuit Breaker Co.,
Switchgear Div.34
Gray & Rogers Advg.

Indiana Steel & Wire Co., Inc.90
Bob Robinson, Inc.

Joslyn Mfg. & Supply Co.85

KPF Electric Co.22, 23
L. C. Cole Co., Inc.

Kearney Corp., James R.86
Lynch & Hart Advg. Co.

Kuhlman Electric Co.14
Fred M. Randall Co.

Line Material Industries,
McGraw-Edison Co.11
Erwin Wasey, Ruthrauff & Ryan, Inc.

Moloney Electric Co.Outside Back Cover
Hebert-Robinson, Inc.

Reliable Electric Co.12
J. Roy McLennan Advg.

Riley Stoker Corp.40, 41
Seth R. Martin Advg.

Rome Cable Div.,
Aluminum Co. of America75, 76
The Rumrill Co., Inc.

Sangamo Electric Co.88
Arthur R. Mogge, Inc.

Southern Electrical Co.38
The Purse Co.

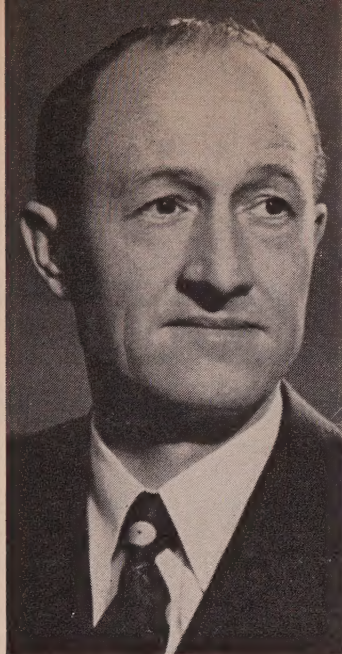
Studebaker-Packard Corp.,
Fleet Sales Div.35
D'Arcy Advg. Co.

United States Steel Corp.,
American Bridge Div.81, 82, 83, 84
Batten, Barton, Durstine & Osborn, Inc.

Wagner Electric Corp.78, 79
Arthur R. Mogge, Inc.

Westinghouse Electric Corp.,
Pittsburgh.....15, 27, 28, 29, 30, 36, 37
Fuller & Smith & Ross, Inc.

Electric Light and Power, December 15, 1960



LIGHT AND POWER LINES

Our Industry Girds Itself For The "Soaring Sixties."—Not only is our electric light and power industry keenly aware of the many challenges that face it in the decade ahead but it is exhibiting firm determination to meet those challenges head on. In so doing, our industry will contribute in large measure to creating what many believe will prove to be the "Soaring Sixties."

Many of the more important areas in which our industry is forging ahead with new zeal and confidence are touched upon by leading industry spokesmen in the special "Look Ahead" section of this issue. Their views are deserving of close attention by all segments of our industry, for they help to chart our industry's course in the year ahead.

Of prime importance to everyone in our industry is the magnitude and makeup of the utilities' new-construction program for the year ahead. Through the cooperation of electric utilities throughout the nation, we are enabled to closely estimate our industry's over-all program and also its detailed equipment requirements. These findings will be published in our Jan. 15 issue, together with EEI's own year-end report, and a comprehensive analysis of long-range trends in power use, all profusely illustrated with special EL&P charts.

It appears now that our electric utilities are budgeting for new construction in 1960 that will exceed 1959 new-construction expenditures by close to three percent. The anticipated total expenditures approximate \$4.3-billion, with about 40 percent to be invested in new generation facilities, 17 percent in new transmission facilities, 38 percent in new distribution facilities and five percent in general plant.

Granted that 1960 will fall short of establishing all-time highs in construction of new facilities by the electric utilities, their program is still one of the largest in the nation and carries with it a com-

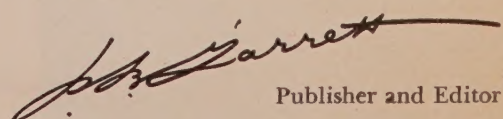
mensurate challenge to all parts of our industry.

A Step In The Right Direction—Is it not extremely important to any power company that its employees be alerted at all times to new laws passed by Congress, as well as pending legislation, that might adversely affect the company's operations and their jobs? It is apparent that the Wisconsin Public Service Corporation thinks so, for its employee magazine recently carried such a "legislative scoreboard."

Brief resumes were given on four such bills passed by the 86th Congress. Included were HR 9105, the Public Works Appropriations bill for 1960, also referred to as the "Pork Barrel" bill; HR 7523, providing a one-year extension of the 52 percent Corporate income tax rate; HR 3460 authorizing TVA to issue 50-year revenue bonds to finance its future power program; and HR 7175 appropriating \$136-million for rural electrification, \$79-million for rural telephones, and a \$25-million contingency fund for each program.

Also briefly reviewed were four pending bills that would authorize expenditures totaling well over one-half billion dollars for new government-financed power projects, plus a bill to amend the Internal Revenue Code for 1954 so as to provide that expenditures by public utilities for "propaganda" advertizing, lobbying, and other political purposes shall not be allowed as deductions from gross income.

This company's effort to inform its employees in this important area is to be highly commended, for there is no substitute for an informed public, of which power-company employees are a key element.


Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
D. L. Hemmenway, Senior Technical Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Philip S. Griffin
Donald R. Crane

NEW YORK 22—130 E. 56th St.
PLaza 1-1863

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
YUkon 6-0647

LOS ANGELES 5—3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JA 9-6711

SEATTLE 1—1008 Western Ave.
MA 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
CApitol 2-5146

Vol. 38

Contents for January 1, 1960

No. 1

| | |
|----------------------------|---|
| Light And Power Lines..... | 3 |
| News In Perspective..... | 7 |

MANAGEMENT / MARKETING

| | |
|--|----|
| Management And Marketing Developments..... | 24 |
| Washington Outlook..... | 27 |
| Regulatory Review..... | 28 |
| Nuclear News..... | 30 |
| Management Look-Ahead..... | 33 |

What 15 top industry leaders foresee for 1960

ENGINEERING / OPERATION

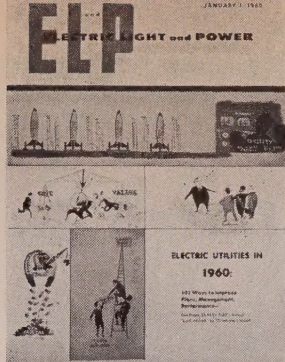
| | |
|--|----|
| Engineering/Operations Briefs..... | 45 |
| Digital Computer Enhances Distribution System Control..... | 46 |

Distribution is a prime application for the digital computer because of its ability to handle large masses of data at a fraction of cost of manual work.

By G. P. Rhoten, Senior Design Engineer, Texas Electric Service Company

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge of 50 cents per single copy and \$10 per year for domestic mailing, and \$1 per single copy and \$15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1959



OUR COVER

The big challenges for electric utilitymen at the start of the new decade—including a few depicted by EL&P Artist Schiavo—are outlined by 15 industry leaders on pages 33-44.

Helicopters Help Build 12-KV Grand Canyon Line.....50

Arizona Public Service preserves Canyon beauty by flying in supplies; avoids building roads, tramway.

Radiography Checks Welds In Pipe-Type Cable Lines.....52

Gamma ray photography proves superior to pressure testing; speeds job completion.

By Howard L. Davis, Jr., Engineer-in-charge, T&D Section, Electrical Engineering Division, Philadelphia Electric Company

New Considerations In Short Circuit Calculations.....55

Improved accuracy was obtained through use of additional correction factors.

By J. R. Rankin, Jr., Assistant Professor of Electrical Engineering, Rutgers State University, and G. I. Stillman, Engineer, System Planning and Development Department, Public Service Electric and Gas Company

MANUFACTURERS / PRODUCTS

Manufacturers' Developments58

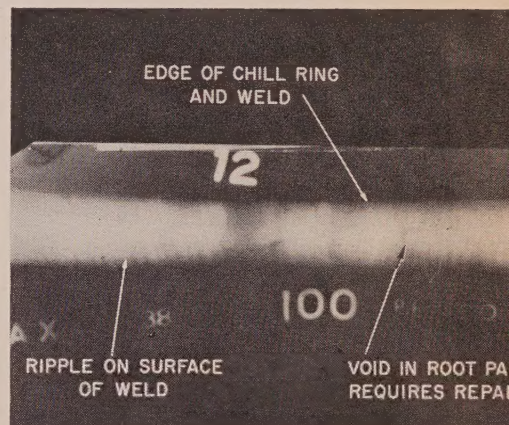
New Product Design.....59

New Literature And New Product Briefs.....61

Men Of Power.....68

Calendar Of Events.....70

Index To Advertisers And Their Agencies.....70



Checking welds in pipe type cable by x-ray and gamma ray expedites job completion, trench backfilling and pavement restoration.



Helicopters solve near-impossible transportation problem in construction of Arizona Public Service Company Grand Canyon Line.

BPA Business Publication
Audit of Circulation, Inc.

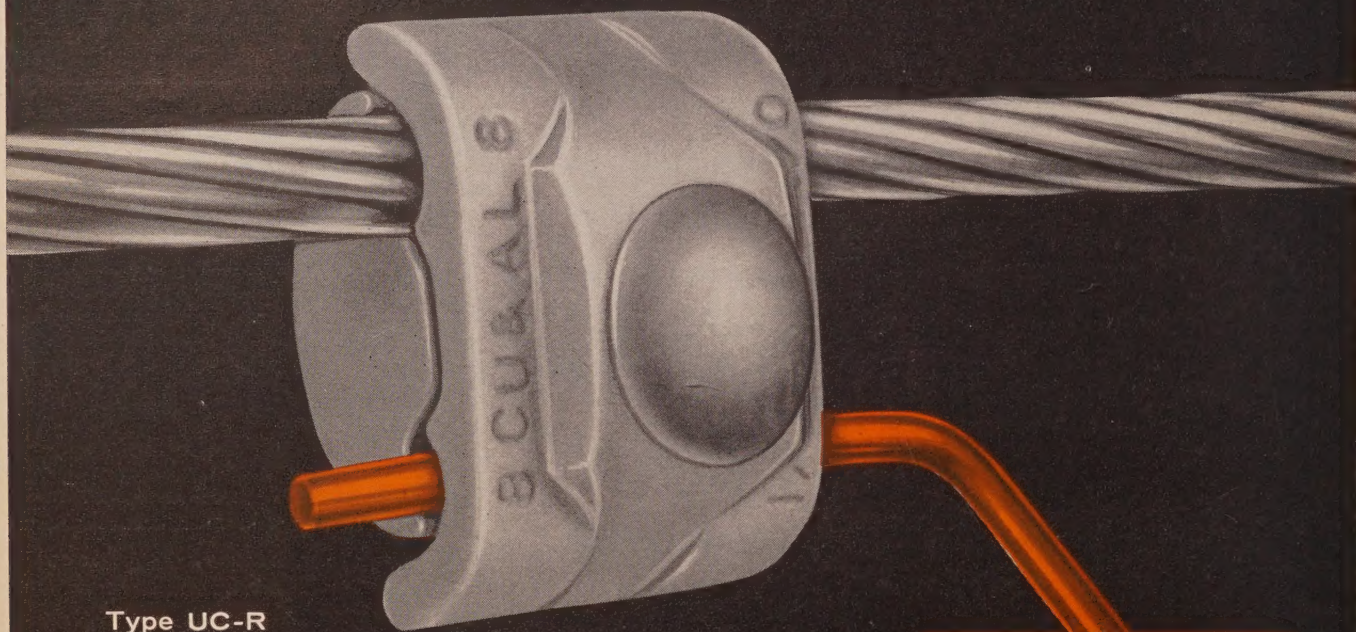
NBP National Business
Publications, Inc.

**Society of Business
Magazine Editors**

**READERSHIP
RESEARCH** The Eastman Research
Organization, Inc.

TAPIT

connects Aluminum to Copper...
*better ... for 35% less**



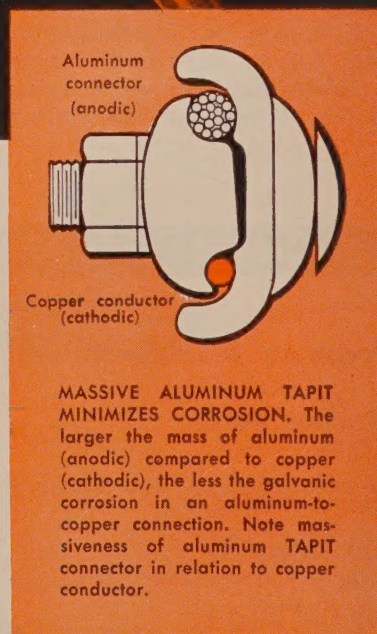
Type UC-R

Field experience and extensive tests have proven that the massive aluminum TAPIT design withstands effects of galvanic corrosion better than copper-bushed or plated aluminum connectors on aluminum to copper conductor combinations.

*Massive aluminum design also... by eliminating need for copper bushings or special plating... saves at least 35% in cost of connectors for aluminum to copper.

Only five sizes required for joining any conductor combination in #8 thru 400 Mcm range. Stocking is simplified... TAPIT can also be used on aluminum to aluminum. Also available with PENETROX sealed in with STRIPSEAL.

Ask your Burndy representative how you can save 35% on aluminum to copper connections—and get better connections—or write directly to Burndy, Norwalk, Connect., or Toronto, Canada.



MASSIVE ALUMINUM TAPIT MINIMIZES CORROSION. The larger the mass of aluminum (anodic) compared to copper (cathodic), the less the galvanic corrosion in an aluminum-to-copper connection. Note massiveness of aluminum TAPIT connector in relation to copper conductor.

TAPIT® — *another engineered solution to your connector problems by*
BURNDY

Norwalk, Connect.

In Europe: Antwerp, Belgium

Toronto, Canada



LIGHT AND POWER LINES

GOOD TIMES AHEAD . . . For The Nation And For Our Industry — Bullish predictions for 1960 are practically unanimous. So much so, in fact, that as a nation we shall need to beware the pitfalls of overconfidence.

All of the ingredients are at hand for a bigger and better 1960; possibly the best year yet. We have higher per capita income and purchasing power, together with healthy consumer buying spirit. Capital goods expenditures are on the increase. Inventory building is due to exert a powerful economic force. There is even the likely prospect of reaching our long-anticipated half-a-trillion-dollar economy.

On the debit side we of course have the threat later on, of a possible walk-out on the railroads. But the mighty force of public opinion and legislative action may blow away even these clouds on our rosy horizon.

Our industry could just rest on its oars and hope to be carried along on this tide of good times. It won't be that simple, for the challenges and the problems of our industry are ever with us . . . many of them essentially the same as they were a year ago, and all displaying strong evidence of their continuing nature.

We have our ever-present problem of selective loadbuilding designed to materially improve system load factor and increase net return on investment. With the entire industry expending many millions of dollars and hard, concerted effort on the electrical living program, there are brighter prospects in this area than ever before.

Electric heating—the key factor in offsetting the

summer air conditioning peak—is clearly off to a running start at this point and offering the industry's principal bulwark against the inroads of stepped-up gas competition.

Our industry's healthy margin of reserve largely eliminates any present problem in meeting even greatly increased demands on our generating capability. However, deferred strengthening and expansion of transmission and distribution facilities may result in serious bottlenecks if load growth should exceed load predictions.

Unless all our long-range prognostications fall far short of expectations, our entire industry still faces the great problem of creating a doubled national network of power systems in a limited number of years, with little or no increase in utility manpower.

The extremely severe fluctuation in levels of purchasing that have afflicted our industry in recent years have had serious repercussions among the electrical manufacturers. Highly-trained production forces have had to be reduced in size. Some research and development work has had to be curtailed. All of which can lead to large headaches for the electric utilities later on.

Looming large in tomorrow's picture is the impact of ballooning scientific research on a national scale. Some of the fruits of these vast efforts are just beginning to emerge from our laboratories and can be expected to result in entirely new products and probably whole new industries. And most of them undoubtedly will be big consumers of electricity.

Our short-range and long-range prospects are exhilarating and challenging. But those good times ahead won't "just happen"; of that we can be sure. It will take the traditional American drive for an ever-better life. And our industry must keep in the forefront of this drive if it is all to come to pass.


Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
D. L. Hemmenway, Senior Technical Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Philip S. Griffin
Donald R. Crane

NEW YORK 22—130 E. 56th St.
Plaza 1-1863

W. A. Clabault, Vice President and
Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
PRospect 1-0505

Orrin Eames, Vice President,
Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
YUkon 6-0647

LOS ANGELES 5—3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JA 9-6711

SEATTLE 1—1008 Western Ave.
MA 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
Capitol 2-5146

Vol. 38

Contents for January 15, 1960

No. 2

| | |
|----------------------------|---|
| Light And Power Lines..... | 3 |
| News In Perspective..... | 7 |

MANAGEMENT / MARKETING

| | |
|---|----|
| Management And Marketing Developments..... | 63 |
| Washington Outlook | 65 |
| Economic Outlook | 66 |
| Nuclear News | 67 |
| Regulatory Review | 68 |
| Industry In Conference (Sales, Management)..... | 70 |

Report of the Southeastern Electrical Exchange Sales, Advertising and Public Relations Conference.

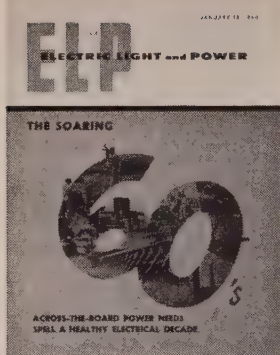
EL&P CONSTRUCTION FORECAST

The staff of Electric Light and Power checks and evaluates the year ahead for the entire Electric Utility Industry as the Soaring 60's begin.

| | |
|--|----|
| EEL Report | 74 |
| Industry growth continued during 1959, with tremendous potential ahead during the coming year. | |
| Power Use | 80 |
| Power needs in all categories should more than double total power use in the coming decade. | |

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge of 50 cents per single copy and \$10 per year for domestic mailing, and \$1 per single copy and \$15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



OUR COVER

All indications point to the decade as being the Golden 60's. Design is by EL&P Art Director, Joe Schiavo.

Outlook For Manufacturers 86

1960 should bring a wealth of new orders to suppliers, even though adverse conditions may prevail in certain areas.

Construction Survey 89

The new year should provide the third best year for capital expenditures in the history of the industry.

Industry In Conference (Technical) 97

Report of the Sangamo Engineering Conference and the G-E Utility Sales Executives Meeting.

MANUFACTURERS / PRODUCTS

Manufacturers' Developments 102

New Product Design 108

New Literature And New Product Briefs 113

Men Of Power 120

Calendar Of Events 126

Index To Advertisers And Their Agencies 126



Building for tomorrow . . .

. . . for more capacity



This is adequate storage for Lapp POC* Bushings



There's no special care needed in handling or storing Lapp POC* Bushings. No overhead for expensive storage space. Leave them in their crates, indoors, outdoors, wet, dry, in pole yards, even at substation sites. Weather won't hurt them over any period of time.

This is because Lapp POC* is the totally-enclosed bushing design. Its paper-oil insulated condenser core is housed and protected end-to-end. All exposed insulation is *porcelain*, including the shank. It pays off in service, too, because porcelain is inorganic . . . won't track or deteriorate under leakage current from surface contamination.

Lapp POC* Bushings meet ASA standards. Their small diameter permits their use as high-performance replacement for bushings (15 kv to 161 kv ratings) on any transformer equipment . . . new or old . . . on your system. Let us show you how you can reduce stock inventory, save on warehouse space and cost . . . and improve system reliability . . . by stocking only required sizes of Lapp POC* Bushings together with necessary flange adapters.

Lapp Insulator Co., Inc., Le Roy, N. Y.



Lapp
POC*
BUSHING

***PAPER-OIL CONDENSER TYPE
TOTALLY-ENCLOSED CORE
ASA STANDARD**



LIGHT AND POWER LINES

Philanthropic Giving By Regulated Utility Wins Commission Sanction — Praiseworthy good judgment has been displayed by the Illinois Commerce Commission in sanctioning a \$260,000 contribution by the Illinois Bell Telephone Company to Chicago's Community Fund — Red Cross Joint Appeal. This Commission's finding contains important implications for many of our electric utilities.

The Commission found Chicago's Joint Appeal to be "of vital importance to the maintenance of stability of the community and to the alleviation of human needs therein."

On this premise, the Commission rejected a complaint that Illinois Bell acted illegally in contributing to the fund, plus providing some services of its executives.

The charge against Illinois Bell was based on the argument that a monopoly utility, whose rates and earnings are regulated, cannot be permitted to spend money for purposes remote from its business, since its expenditures go into charges for its service. This reflects an outmoded view, as the trend of decisions has been steadily in the direction now established in Illinois.

It is a healthy sign when official recognition is given to the fact that the social and economic welfare of a community is of long-range selfish interest to the utilities serving it, their stockholders, and their customers.

Now They're Using Watthour Meters For Targets — Local nimrods are finding the Arizona Public Service Company's electric meters an irresistible target for air-rifle practice.

One case reported involved a meter on a Phoenix church, which showed clear evidence of at least 43

shattering bullseyes through the glass cover. Amazingly, the meter was still operating.

Obviously some youngster is no respecter of church grounds when a likely target is spotted. Nor is this youngster likely to have any more respect for transmission-line insulators when he grows up and gets a high-powered rifle in his hands.

Such damage on this company's system is reported to reach a peak during children's summer vacation, with another concentrated outbreak immediately following Christmas.

Undoubtedly many other electric utilities are contending with similar juvenile vandalism. With Arizona Public Service's annual loss from this type of vandalism mounting close to \$7,000, the national figure must be of serious proportions.

It is apparent that the steps urged previously to curb the dangerous and costly vandalism caused by gun-toting adults must now be broadened to cover equally thoughtless youngsters.

Safety Hats Can Become Dangerous Missiles — They take on this unhappy role when placed in the rear window of a car or truck and a sudden stop causes them to fly off the window ledge and strike the head or neck of the driver or another occupant.

It is a very natural impulse for those who wear safety hats to remove them when entering their automobiles or trucks, and to place them on such a handy shelf. However, keeping them on eliminates the danger of converting them into flying missiles and also provides valuable protection for the wearers in case of a serious collision or smashup.

J. B. Jarrett
Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, *Publisher and Editor*
N. H. Jacobson, *Executive Business Editor*
K. S. Jacobs, *Managing Editor*
D. L. Hemmenway, *Senior Technical Editor*
John T. Tyner, *Associate Editor*
R. C. Blatt, *Eastern Editor*
R. A. Lincicome, *Associate Business Editor*
R. O. McGougan, *Western News Editor*
Ralph Elliott, *Washington Editor*
E. J. Cecil, *Washington Correspondent*
A. C. Farmer, *Economic Consultant*
Edward Gordon, MBA, *Research Director*
J. J. Schiavo, *Art Director*

BUSINESS STAFF

D. M. Wulf, *Advertising Production*
William Howat, *Circulation Manager*
Marshall Haywood, Jr., *President*

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Philip S. Griffin
Donald R. Crane

NEW YORK 22—130 E. 56th St.
Plaza 1-1863

W. A. Clabault, *Vice President and Eastern Manager*
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, *Vice President, Cleveland Manager*

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
YUkon 6-0647

LOS ANGELES 5—3727 West 6th St.
DUNKirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JA 9-6711

SEATTLE 1—1008 Western Ave.
MA 3-3766

DENVER 3—620 Sherman St.
KEYstone 4-4669

PORTLAND 4—404 Times Building
CAPitol 2-5146

Vol. 38

Contents for February 1, 1960

No. 3

Light and Power Lines..... 3

News In Perspective..... 7

MANAGEMENT / MARKETING

Management And Marketing Developments.....25

Washington Outlook28

Nuclear News30

Economic Outlook33

How Utility Solved Graphic Information
Handling Problems34

Efficiency and economy result from new system; promise of broadened application points to additional benefits.

By George E. Dana, Assistant Chief Electrical Engineer,
New York State Electric & Gas Corp.

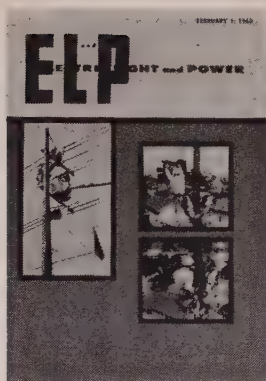
Electric Heating Will Cut Costs Of New Nurses Home....36

Initial installation makes substantial saving, and operation at low-block rate will enhance the economy picture; future expansion greatly simplified by system design.

By John Hackler and John Lee, Foley, Hackler, Thompson
and Lee, Architects, Peoria, Illinois

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge of 50 cents per single copy and \$10 per year for domestic mailing, and \$1 per single copy and \$15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



OUR COVER

Phil Klein and Al Olsen, Northern Indiana Public Service Company linemen, observe the necessary precautions of rubber gloves, sleeves, blankets, hard hats, and other safety measures which have contributed to the company's distinguished performance record in the field of safety.

POWER

ENGINEERING / OPERATION

Engineering/Operations Briefs 37

Telemetry Tool Probes Audible Noise From 345-kv Line..... 38

Vibration and strain data transmitted for first time by radio link through electric field of EHV line.

By James J. Ratkowski, Engineering Assistant, Commonwealth Edison Company, and Robert A. Eucker, Senior Engineer, Technical Service Section, Preformed Line Products Company

Epoxy Gas Blocks Simplify Cable Pressurization Program 41

High wetting power and insulation of casting resins provide gas-tight seals for control and communication cables.

Wide, Straight Transmission R/W Is Often The Least Costly..... 42

Shorter spans and angle structures frequently cost more than adequate, near-straight R/W permitting long spans.

By Frank W. Shaw, Engineer, Kansas City Power & Light Company

Utility Man's Notebook..... 44

MANUFACTURERS / PRODUCTS

Manufacturer's Developments 46

Supply Facilities 48

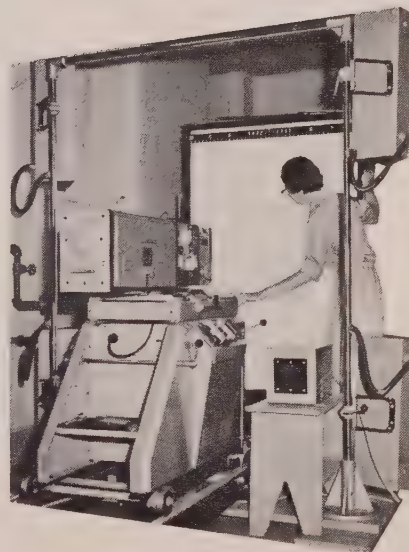
New Product Design..... 52

New Literature And New Product Briefs..... 53

Men Of Power..... 60

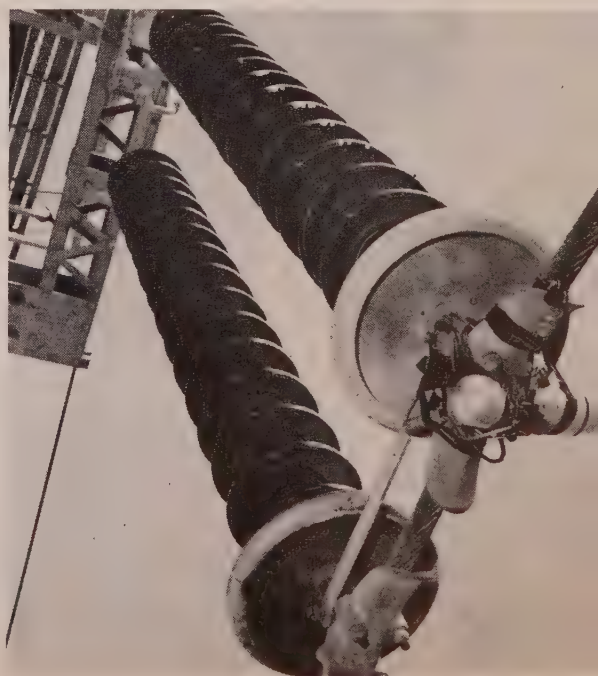
Calendar Of Events..... 62

Index To Advertisers And Their Agencies..... 62



Replacement of 2600 worn tracings annually is only one of several areas where utility saves with new graphic information handling system.

Audible conductor-noise tests prove that vibration data can be telemetered and recorded through a 345-kv field.



BPA Business Publication
Audit of Circulation, Inc.

NBP National Business
Publications, Inc.

**Society of Business
Magazine Editors**

**READERSHIP
Eastman
RESEARCH** The Eastman Research
Organization, Inc.

21 Years Underground

—and still as good as new!

21 years ago, the **Niagara Mohawk Power Company** specified Burndy MOLEs for their underground modernization program. Specifications called for a connector that would perform without fault, under prolonged exposure to dampness, oils, extreme temperatures, and last the life of the cables connected. The MOLEs met all specifications, and are as good as new today ... proof beyond doubt that Burndy MOLEs have the high quality necessary for underground systems.

Utilities thruout the country have had similar long years of trouble-free experience with the MOLE...experience that proves that the MOLE meets underground specifications for maximum dependability.

If you are considering "going underground", or expanding your present system don't take a chance on costly burn-outs and disrupted service, call your local Burndy representative...he has had years of underground experience and can help you get maximum dependability and flexibility in your underground system.

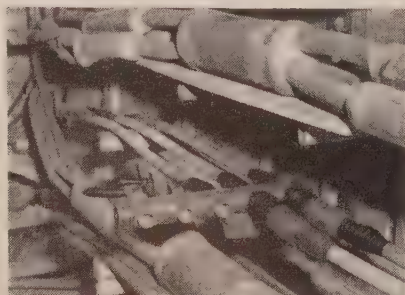


Photo from Niagara Mohawk Power's file, dated 1938, showing actual installation of MOLE in its underground system. These same MOLEs are in operation today, after 21 years of trouble-free performance.

BURNDY

ELECTRICAL CONNECTORS



LIGHT AND POWER LINES

Cooperative Research By Electric Utilities Brings Maximum Returns For The Industry—For several years now, the EEI Research Projects Committee has been building up the research sponsored by EEI with the purpose of getting more adequate coverage of those things which should be done by the industry as a whole and at the same time relieve the individual companies somewhat by more cooperative projects. This approach is so sound that the work of this committee should go on indefinitely. Moreover, its work probably will increase in volume and importance to the industry.

Next in importance in the field of cooperative utility research are projects initiated by groups of utilities confronted with problems of a more regional nature. One such project has just been inaugurated by the six power companies which comprise the Indiana Electric Association.

These utilities have entered into a contract with Purdue University Research Foundation to study the characteristics of mechanically-collected Indiana flyashes.

The six utilities participating in this endeavor are the Indiana and Michigan Electric Company, Indianapolis Power & Light Company, Northern Indiana Public Service Company, Public Service Company of Indiana, Inc., Southern Indiana Gas & Electric Company and Mooresville Public Service Company, Inc.

The research program will be undertaken in two phases. The first phase of the program, which is estimated to cost \$9000 and which should be finished by mid-1961, will comprise two studies. The first study will determine how the physical and chemical properties of the various mechanically-collected flyashes in Indiana differ from the electrostatic flyashes now being used extensively as admixtures in concrete. The sec-

ond study will determine the effect of these characteristics upon the pozzolanic properties of the flyash.

The second phase of the program will be made essentially to determine how the Indiana flyashes can best be utilized in concrete and for other useful purposes. The exact extent of the second phase of the project has not been determined as yet and will be influenced largely by the results obtained in the first phase.

Findings from this Indiana flyash research project may have considerable value to utilities in other sections of the country. Likewise these Indiana utilities stand to benefit from research endeavors on a national scale.

Those Missing Billions In Tax Revenues From Electricity Sales—For the 17-year period 1942 through 1958 electricity supplied to customers of presently tax-exempt organizations, if sold by taxpaying companies, would have yielded \$2.7-billion to the Federal treasury. Projection of similar tax yield for the next 17 years shows that \$11.5-billion would flow to the Federal treasury which it will not receive under the present tax-exempt situation.

So stated E. Roy Gilpin, of the New York firm of Reid & Preist, in a statement presented before a recent meeting of the Committee on Ways and Means of the House of Representatives.

These simple but eloquent statistics are ample demonstration of what tax equalization, or lack of it, means.

Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, *Publisher and Editor*
 N. H. Jacobson, *Executive Business Editor*
 K. S. Jacobs, *Managing Editor*
 D. L. Hemmenway, *Senior Technical Editor*
 John T. Tyner, *Associate Editor*
 R. C. Blatt, *Eastern Editor*
 R. A. Lincicome, *Associate Business Editor*
 R. O. McGougan, *Western News Editor*
 Ralph Elliott, *Washington Editor*
 E. J. Cecil, *Washington Correspondent*
 A. C. Farmer, *Economic Consultant*
 Edward Gordon, *MBA, Research Director*
 J. J. Schiavo, *Art Director*

BUSINESS STAFF

D. M. Wulf, *Advertising Production*
 William Howat, *Circulation Manager*
 Marshall Haywood, Jr., *President*

BUSINESS OFFICES

CHICAGO 2-6 N. Michigan Ave.
 Central 6-3690

Phillip S. Griffin
 Donald R. Crane

NEW YORK 22-130 E. 56th St.
 Plaza 1-1863

W. A. Clabault, *Vice President and Eastern Manager*
 D. M. McCarthy

CLEVELAND 15-1836 Euclid Ave.
 Prospect 1-0505

Orrin Eames, *Vice President, Cleveland Manager*

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.
 SAN FRANCISCO 5-625 Market St.
 YUkon 6-0647
 LOS ANGELES 5-3727 West 6th St.
 DUnkirk 7-5391
 HOUSTON 6-3217 Montrose Blvd.
 JA 9-6711
 SEATTLE 1-1008 Western Ave.
 MA 3-3766
 DENVER 3-620 Sherman St.
 KEystone 4-4669
 PORTLAND 4-404 Times Building
 Capitol 2-5146

Vol. 38

Contents for February 15, 1960

No. 4

| | |
|----------------------------|---|
| Light And Power Lines..... | 3 |
| News In Perspective..... | 7 |

MANAGEMENT / MARKETING

| | |
|--|----|
| Management And Marketing Developments..... | 59 |
| Washington Outlook..... | 61 |
| Regulatory Review..... | 62 |
| Nuclear News..... | 64 |

ENGINEERING / OPERATION

| | |
|---|----|
| Engineering/Operations Briefs..... | 65 |
| Power Station Vulnerability To Nuclear Blast..... | 66 |
| Study permits prediction of patterns of recovery from nuclear blasts for power plants, switchyard equipment and associated structures. | |
| By E. T. B. Gross, Professor of Power Systems Engineering, Illinois Institute of Technology, and Consultant, Armour Research Foundation, and D. B. Singer, Assistant Supervisor of Structural Mechanics, Armour Research Foundation of Illinois Institute of Technology | |

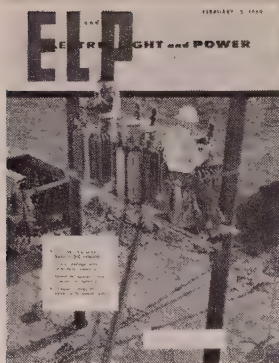
| | |
|--|----|
| Program For Planning (Part V) | |
| Model Shows Generating Capacity Available..... | 69 |

Simulation through use of mathematical model of system generating capacity, which includes chance events and human decisions, achieves new realism in planning.

By C. J. Baldwin, *Electric Utility Engineering Dept., Westinghouse Electric Corporation*, and J. E. Billings, *Electric Generation Dept., Public Service Electric and Gas Co.*

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is subscription charge of 50 cents per single copy and \$10 per year for domestic mailing, and \$1 per single copy and \$15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



OUR COVER

Carolina Power & Light crew busily at work installing two 110-kva and one 167-kva transformers to serve Carolina Sportswear Company, Inc., at Warrenton, N. C. This plant is all-electric, with heat pumps for both summer and winter "climatizing."

POWER

Silicon Rectifiers Supplement D-C Network Load..... 74

Supplying d-c load through rectifiers enables utility to shut down substations, eliminate maintenance; future units may be connected to secondary network removing need for separate transformers now used.

By Charles W. Smith, Jr., Assistant Division Head, Technical Service Division, Transmission and Distribution Dept., Boston Edison Company

Five Years Experience With Secondary Capacitors In Series With Distribution Transformers..... 77

Voltage level improvement and reduced flicker have resulted from applications, best improvements occurring on fully-loaded transformers serving low power factor loads.

By Fred C. Crowell, Load and Voltage Control Supervisor, Tulsa Area, Public Service Company of Oklahoma

Microwave Distance Measurements Speed Transmission Surveys..... 80

Tellurometer functions successfully up to 40 miles through weather and visibility conditions which would halt conventional survey methods.

By M. J. Urner, Manager, Transmission and Distribution Dept., Potomac Edison Company

Nicaragua Builds Unified Power System..... 82

Complete new system, designed and built on turnkey basis, supplies 75 percent of population; towns buy own distribution systems in installments.

By P. H. Jeryan, Chief Resident Engineer, The Kuljian Corporation

Utility Man's Notebook..... 85

MANUFACTURERS / PRODUCTS

Manufacturers' Developments..... 95

New Literature And New Product Briefs..... 103

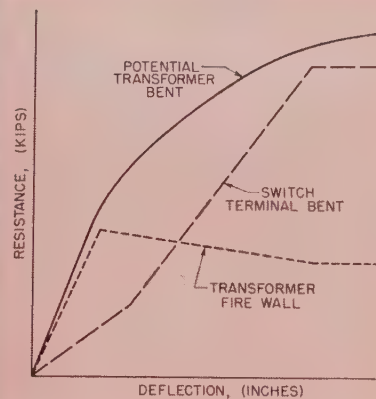
New Product-Design..... 108

Supply Facilities..... 116

Men Of Power..... 118

Calendar Of Events..... 120

Index To Advertisers And Their Agencies..... 120



Deformation of power plant components from nuclear blast, and recovery time can be predicted . . .

Tellurometer is effective up to 40 miles for transmission line surveying . . .

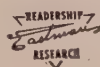


BPA Business Publication Audit of Circulation, Inc.

NBP National Business Publications, Inc.

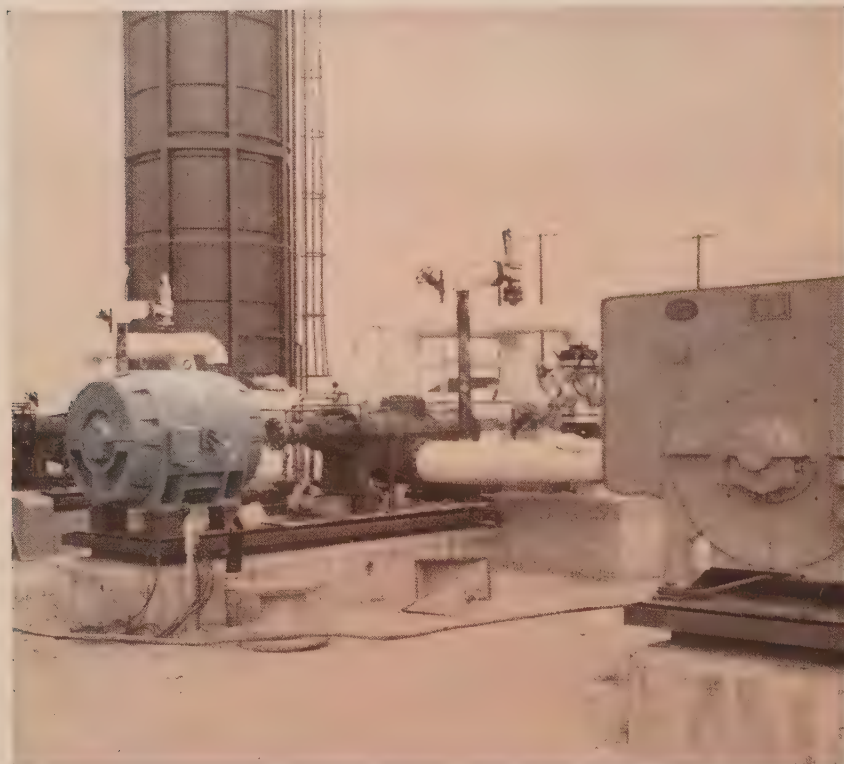


Society of Business Magazine Editors



The Eastman Research Organization, Inc.

Banish Costly Enclosures



Save on Outdoor Motors by Specifying Silicone Insulation

Dramatic proof of size and weight savings made possible by motors with silicone insulation systems is demonstrated by these outdoor direct coupled pump drives at the Alamitos Steam Station of Southern California Edison Company. Here, self-protecting silicone rubber insulation means substantial dollar savings in enclosure cost for the smaller, open frame motor.

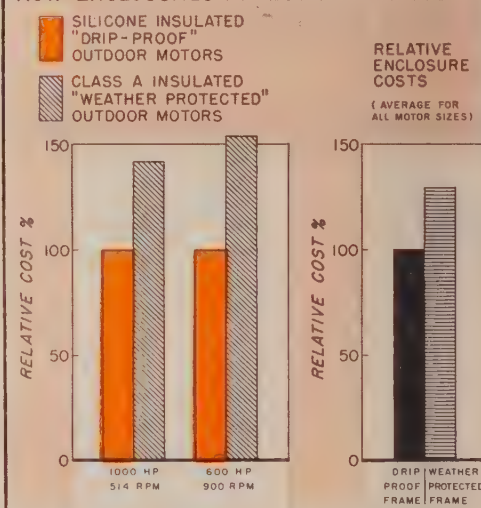
Both motors have 400-hp ratings. The difference in weight between the two motors is well over 1,000 pounds. Why is one motor so much larger than the other? Because the smaller Allis-Chalmers motor has a self-protected Silco-Flex insulation system incorporating Silastic®, the Dow Corning silicone rubber. The other motor is insulated with conventional materials requiring the protection of a more elaborate enclosure.

Despite its much smaller size, the silicone insulated motor also has a 15% service factor not found in the larger unit. This extra cushion against overloads assures greater reliability and longer life for the smaller unit.

Silicone rubber insulated motors for pump drives, fan drives, or other applications can withstand torrential rains, corrosive fumes, fly ash, dust, salt air, snow, sleet, cold, heat . . . even flooding! That's why it's wise to specify motors with insulation systems made from Dow Corning Silicones for greater reliability and maximum savings.

For more information, write Dept. 1402.

HOW ENCLOSURES AFFECT MOTOR COSTS



Savings of 30% and better result from specifying motors with insulation systems made from Silastic. Silicone rubber produces a homogeneous, resilient insulation system unaffected by heat, cold, moisture, abrasives, many chemicals and corrosive atmospheres. No need to buy expensive enclosures. Insulation systems made of Silastic are self-protecting, permit open enclosures outdoors where weather-protected frames would otherwise be required. There's no need for a premium priced enclosure to protect the insulation.



What's more, Silastic's extra thermal capacity provides motors, transformers, and other equipment with additional service factor for absorbing overloads. These motors — with a generous service factor built-in — add immeasurably to reliable service . . . operate more economically.

SPECIFY Dow Corning Silicones
and **SAVE!**



Dow Corning CORPORATION

MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.



LIGHT AND

POWER LINES

Needed From Civilian Inventors: Solutions To Some Of Our Armed Forces' Technical Problems—If any of our utility engineers have suggestions for solution of the many hundreds of technical problems which now handicap our Armed Forces, the National Inventors Council, U. S. Department of Commerce, would like to hear from them.

Although it is quite unlikely that ready answers will be forthcoming because of the very special nature of these problems, no possibilities should be overlooked.

A new list of 300 problems presenting challenges in almost every field of science and technology was recently released by the Council. This list may be obtained on request from NIC, U. S. Department of Commerce, Washington 25, D. C.

In the field of rocketry, for example, there is urgent need for a power source other than nuclear that will not require refueling on long space flights, and a one-hot, lightweight structure made of something other than metal. Control systems, a major source of missile failures, must be improved, and so must guidance systems.

Military mechanical engineers are looking for ideas for such things as lightweight laundry equipment that uses little or no water; a device to boil a bucketful of water in five minutes; noise suppressors for jet engines; seals to prevent gas leakage at exceedingly high pressure and heat.

In electronics, improved transistors and microwave oscillators are required, as are self-activating spare electronic components to go into operation automatically as other parts fail.

"Since 1940," says John C. Green, executive director of the Council, "the NIC has been advising civilian inventors of problems standing in the way of national defense developments, evaluating proposed solutions from the inventors, and turning promising ideas over

to the proper military agencies. Through the Council have come many important inventions and ideas which have saved lives, money, and manpower, and have improved our armaments."

An Assist For A Utility's Visitors—One of our electric utilities has developed a small "welcome" leaflet for visitors to its various offices that is sufficiently unusual to warrant special mention here.

Conspicuously available in the Atlantic City Electric Company's waiting rooms is a small folder titled "Glad You Came In Today" which not only extends a warm welcome to visitors but provides interesting and helpful information for the company's visitors.

Under "Persons You May Wish To See" are listed names and titles of company officers, division managers and district managers, to avoid possible confusion.

Then comes a very brief resume of the company's background, its status today, and its plans for tomorrow.

Over the president's signature appears this concluding statement:

"We want you to have every courtesy and attention while you are visiting us, and to leave feeling satisfied and fully accommodated. Any suggestions for improvement of the reception afforded you, therefore, will be most gratefully received."

Here is a commendable idea to help smooth out and improve any utility's relations with its visitors, particularly the general public.



Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
D. L. Hemmenway, Senior Technical Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2-6 N. Michigan Ave.
Central 6-3690

Phillip S. Griffin
Donald R. Crane

NEW YORK 22-130 E. 56th St.
Plaza 1-1863

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15-1836 Euclid Ave.
PRospect 1-0505

Orrin Eames, Vice President,
Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5-625 Market St.
YUkon 6-0647

LOS ANGELES 5-3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6-3217 Montrose Blvd.
JA 9-6711

SEATTLE 1-1008 Western Ave.
MA 3-3766

DENVER 3-620 Sherman St.
KEystone 4-4669

PORTLAND 4-404 Times Building
CApitol 2-5146

Vol. 38

Contents for March 1, 1960

No. 5

Light And Power Lines..... 3

News In Perspective..... 7

MANAGEMENT / MARKETING

Management And Marketing Developments43

Nuclear News45

Washington Outlook46

Industry In Conference (Sales, Management).....47

Why Industry Meetings?.....52

An appraisal of meetings, associations and their benefits to the individual, the industry, and our free way of life.

By Howard Arnett, Vice-President, Portland General Electric Co.

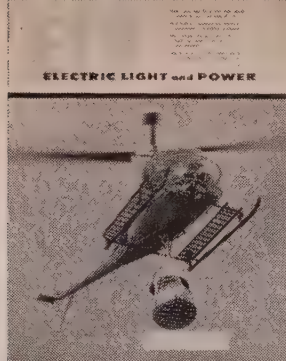
The Employee Information Conference—
One Way To Improve Employee And Public
Relations55

All-employee conference information program vastly improves employee and public relations at very reasonable cost.

By Paul L. Gunn, Director of Employee Relations, Southwestern Electric Power Co.

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge of 50 cents per single copy and \$10 per year for domestic mailing, and \$1 per single copy and \$15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



OUR COVER

Light utility helicopter (Hiller Aircraft) lifts a reel of power cable. To meet growing needs during its lifespan, owner can expand the 3-place helicopter in power and size. Crane helicopters, says Sikorsky, will soon carry 20-ton payloads for 50 miles . . . and 50-ton loads by 1970.

ENGINEERING / OPERATION

Engineering/Operations Briefs.....57

Characteristics Of Electric Heating Loads In The Cleveland Area.....58

Inherent advantages improve competitive position of electric heating but utilities must know load characteristics to serve economically as saturation increases.

By Edward D. Heseman, Senior Engineer, Transmission and Distribution Dept., The Cleveland Electric Illuminating Co.

Fish-Bypass Experience At PGE's New Hydro Projects....62

Operating experience now permits comparative evaluation of two systems in use.

By George J. Eicher, Aquatic Biologists, Portland General Electric Co.

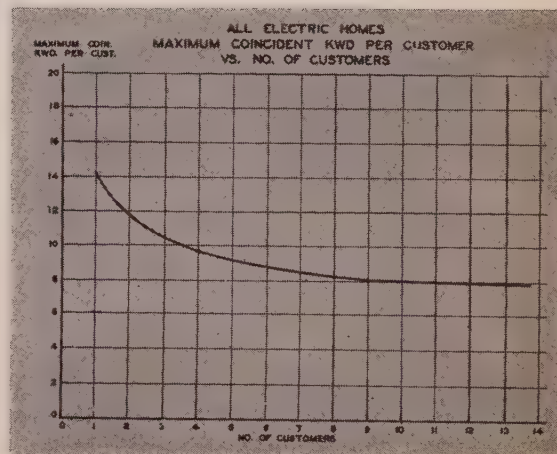
Sag Computations By Two Slide Rules.....65

Simultaneous use of two slide rules provides quick, accurate method for solving sag problems.

By Robert H. Cumming, Assistant Engineer, New England Electric System

Industry In Conference (Technical)72

A report of the EEI Transmission and Distribution Committee's 81st meeting.



Utilities must know characteristics of all-electric loads of future to serve economically.

Accurate solutions to sag problems are reached quickly by operating two slide rules at once.

MANUFACTURERS / PRODUCTS

Manufacturer's Developments76

New Product Design.....78

Supply Facilities80

New Literature And New Product Briefs.....81

To The Editor.....83

Men Of Power.....85

Calendar Of Events.....90

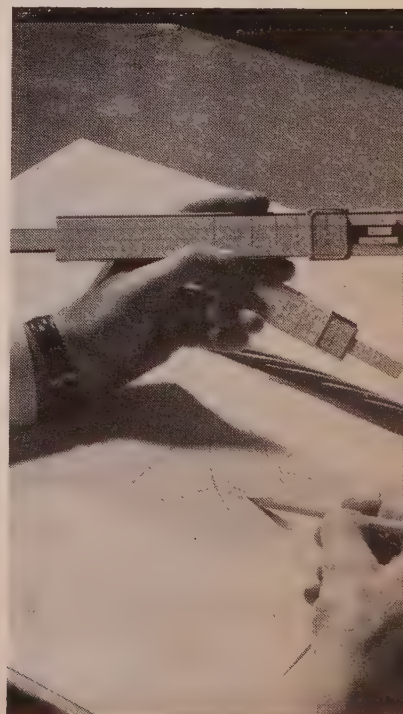
Index To Advertisers And Their Agencies.....90

BPA Business Publication
Audit of Circulation, Inc.

NBP National Business
Publications, Inc.

**Society of Business
Magazine Editors**

**The Eastman Research
Organization, Inc.**

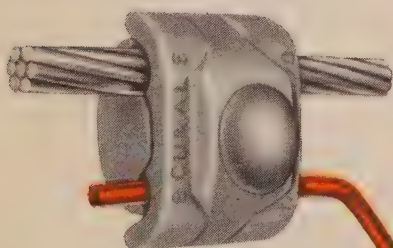


STRIPSEAL

seals in oxide-inhibiting **PENETROX**[®]
...on the connector contact surfaces



No Cutting...No Snipping or Ripping...Just a Gentle Pull



TAPIT[®] with STRIPSEAL makes neat, clean aluminum-to-copper connections.

and your Burndy STRIPSEALED connector is ready to make a trouble-free aluminum connection. STRIPSEAL, the leak-proof, all-weather, plastic cover hugs the connector like a "cocoon"...seals in oxide-inhibiting PENETROX—on the contact surfaces, where it belongs. **It's easy to use**...even with work gloves on. **It's clean**...just dry brush conductor and install the connector; no on-the-job application of oxide inhibitor needed. **It's sure**...lineman can't forget PENETROX. For positive protection of every connection, specify Burndy connectors with STRIPSEAL. Write for full details.

BURNDY



LIGHT AND POWER LINES

Those Indictments Must Not Be Allowed To Disrupt Marketing Relations Vital To Our Industry's Operations—

Last month some of the most valued and respected suppliers to the electric utility industry found themselves in a predicament which they themselves viewed with "shock" and "distress." A forthright description of the industry's reaction to the predicament would undoubtedly match, in concern and regret, that of the accused.

The indicted firms and their accused employees are already penalized—through loss of prestige and position—far beyond the penalties which may be imposed by the Federal government. There is little if anything to be gained by their customers at the expense of the unfortunate situation in which these manufacturers have been placed.

Can there be any constructive outcome from the incident (or incidents)? A more than obvious conclusion might be the assumption that the market for electrical equipment will become more competitive, more "free enterprise," more productive in terms of the public good."

However, where it may be possible to show in specific instances that such is the result, the measurable benefits which may accrue to customers of the manufacturers or the general public will more than likely be less than significant. At the same time, substantial damage could be done to the industry's marketing machinery and relations, if the blame that is due some suppliers in some situations is ascribed in a promiscuous manner to the established and effective ways of doing business in this industry.

At the risk of being numbered among those who can in any dilemma cry: "Now is the time for all good men . . ." we do suggest that this regrettable situation can be turned to good if there is more striving to meet conditions such as these—

1. If in the thinking of businessmen there is a greater sense of responsibility—that would contrast with the premise: what is good for the corporation is best for the public.

2. If in the industry's marketplace there are concessions by both seller and buyer to each other . . . to achieve an orderly improvement of conditions, while avoiding the violent shockwaves that abuses develop . . . As for marketing concessions, for example, suppliers to the utility industry would do well to consider more seriously the desire for pricing reflections of volume buying and "economies and differentials in marketing operations," as expressed most recently in a utility buyers' conference. Then, on the part of utility buyers, the pleas of manufacturers for cooperation in "advance" or "trend" buying to help create a more orderly supply situation should certainly not go unheeded.

Utility customers of the electrical equipment manufacturers readily agree that they **must** afford healthy, profit-making suppliers . . . that they **can not**, in the long run, afford "White Sale" marketing to characterize business practice in this industry. This is more practical economics than "ethics," though a measure of the latter is essential, too.

And now, more than ever before, the utilities can count on the electrical equipment manufacturers to supply them with more than just better products year-after-year. Accused, the industry's biggest manufacturers express anew the important guarantees of competitive enterprise which we ~~all~~ must concede are essential in our way of life.


Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, *Publisher and Editor*
N. H. Jacobson, *Executive Business Editor*
K. S. Jacobs, *Managing Editor*
D. L. Hemmenway, *Senior Technical Editor*
John T. Tyner, *Associate Editor*
R. C. Blatt, *Eastern Editor*
R. A. Lincicome, *Associate Business Editor*
R. O. McGougan, *Western News Editor*
Ralph Elliott, *Washington Editor*
E. J. Cecil, *Washington Correspondent*
A. C. Farmer, *Economic Consultant*
Edward Gordon, MBA, *Research Director*
J. J. Schiavo, *Art Director*

BUSINESS STAFF

D. M. Wulf, *Advertising Production*
William Howat, *Circulation Manager*
Marshall Haywood, Jr., *President*

BUSINESS OFFICES

CHICAGO 2-6 N. Michigan Ave.
Central 6-3690
Phillip S. Griffin
Donald R. Crane

NEW YORK 17-369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, *Vice President and Eastern Manager*
D. M. McCarthy

CLEVELAND 15-1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, *Vice President, Cleveland Manager*

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5-625 Market St.
YUken 6-0647

LOS ANGELES 5-3727 West 6th St.
DUnkirk 7-5391

DALLAS 19-2727 Oak Lawn Ave.
LAkeside 1-1266

HOUSTON 6-3217 Montrose Blvd.
JA 9-6711

SEATTLE 1-1008 Western Ave.
WA 3-3766

DENVER 3-620 Sherman St.
KEystone 4-4669

PORTLAND 4-404 Times Building
CApitol 2-5146

Vol. 38

Contents for March 15, 1960

No. 6

Light And Power Lines..... 3

News In Perspective..... 7

MANAGEMENT / MARKETING

Management And Marketing Developments..... 57

Washington Outlook 61

Economic Outlook 62

Regulatory Review 66

Nuclear News 63

ENGINEERING / OPERATION

Engineering/Operations Briefs 68

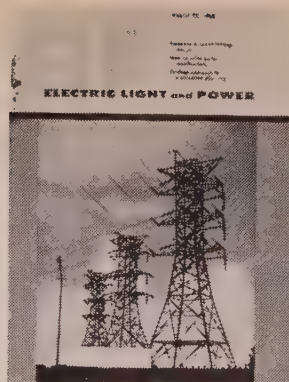
Positive Planning In Distribution 69

Inherent strength, rather than minimum system propped up by emergency measures, should be the goal in planning for service quality and continuity.

By Charles E. Flahie, Chief Electrical Engineer, The Toledo Edison Company

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge of 50 cents per single copy and \$10 per year for domestic mailing, and \$1 per single copy and \$15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



OUR COVER

Dave Binns, a freelance photographer from Florida, was struck by the stately solidarity of these transmission lines and towers. We felt it would make a good cover photo . . . Don't you agree?

How PEPCo Moved Its Largest Transformer..... 72

Uneventful trip from rail siding to station is result of meticulous planning and timing.

By Robert E. Scott, Acting Superintendent, Substation Construction Division, Substation Department, Potomac Electric Power Company

Improved Specifications?—Here's "Why" And "How"..... 74

Adequate specifications ensure all possible cost savings and equipment reliability, protecting buyer and guiding supplier.

By Fred A. Allehoff, E. E., and Delmar C. Johnson, E. E., Portland, Oregon

Economical Footing Design For Transmission Towers..... 79

Economy can be obtained without sacrificing safety by careful attention to details.

By W. C. Freeman and J. R. Arena, Sargent & Lundy, Engineers

Pole Replacement The Hard Way..... 84

"Boarding House Reach" overcomes blocked-access problem.

Industry In Conference 88

Reports of the AIEEE Winter General Meeting and the Doble Engineering Conference.

MANUFACTURERS / PRODUCTS

Manufacturers' Developments 105

New Product-Design 110

Supply Facilities 115

Men Of Power..... 118

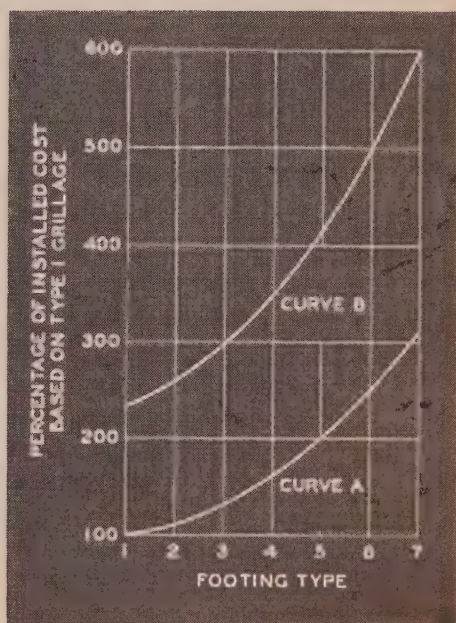
New Literature And New Product Briefs 119

Calendar Of Events 124

Index To Advertisers And Their Agencies..... 124



Moving huge pieces of equipment requires meticulous planning and timing.



Installed cost relationship for various tower footings all designed to support the same load.

When the heat's on...

ROEBLING TELLURIUM LEAD ALLOY SHEATH IS STEADY AND STABLE!

Wiping operations raise sheath temperatures up to 400° F. Stable sheath is what you need when the heat's on! And Roebling's Tellurium Lead Alloy Sheath retains its remarkable creep resistance and bending fatigue resistance under intense heat, and after it.

What's more, there's extra life built into the carefully made paper power cable *inside*. That's why there's simply no better cable buy when it comes to long life, dependable service, minimum maintenance.

Interesting test and other data are now available. Write today for your free copy of the booklet that shows the way to reduced cable and maintenance costs. Electrical Wire, John A. Roebling's Sons Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities

John A. Roebling's Sons Division, The Colorado Fuel and Iron Corporation

Roebling electrical wires and cables are available with either copper or aluminum conductors.





LIGHT AND POWER LINES

Continued Growth Through Continued Reading—Never before has the young engineer's advancement been so dependent on consistent reading that broadens his viewpoint and keeps him abreast of developments in his own field.

No one has stated the case more concisely than did Francis Bacon in his famous quotation:

"Reading maketh a full man; conference a ready man; and writing an exact man. And, therefore, if a man write little, he had need have a great memory; if he confer little, he had need have a present wit; and if he read little, he had need have much cunning, to seem to know that he doth not."

It is sheer folly for any young engineer to take the attitude that because of the heavy demands on his time he just doesn't have time for serious reading anymore.

Admittedly the reading material now available to the young engineer is so voluminous that he must exercise discrimination in his selection of reading material. But it is a sure bet that if he can't manage to find time for reading that will keep him informed and make of him "a full man" he will never progress beyond the routine of his present job.

Writing Ability Can Make The Difference—Young engineers who have acquired the ability to turn out lucid, coherent papers and reports are so much in the minority today that their rapid advancement professionally is practically assured. On the other side of the ledger we find the many young men who appear blissfully unaware that lack of this ability can make the difference between a tremendously successful career and a very mediocre one.

Educators and business leaders alike are exhibiting increasing concern over the marked inability of many young engineers to write grammatically, spell, or

punctuate correctly.

Bright young men entering industry's engineering programs today possess a high degree of facility in basic mathematics. However, a disturbing percentage of them are sadly lacking in ability to use language as a tool for reasoning and communicating.

One of our prominent educators, Dr. Eric A. Walker, president of Pennsylvania State University, has stated his conviction that this situation will not change until the professors—all the professors of all the courses—establish certain minimum standards for the students' written work and then make it clear to the students that violation of those standards is just as serious as violation of the basic principles of mathematics.

Dr. Walker says further that a program of this sort, if carried out conscientiously by the faculties of our engineering colleges, would soon make engineers the most literate of all professional groups in America today.

Failure to stress writing capacity early enough in the educational process has also been cited as a major cause of poor writing. Further, that the greatest trouble is with the written word—putting it down on paper. A college dean is quoted as saying, "You will find men who are very articulate orally who are shockingly incompetent in writing properly."

This situation is not likely to improve until aspiring young engineers are somehow made to realize the profoundly adverse effect that lack of writing skill can have on their own advancement professionally. And, most importantly, they must have the will and tenacity to do something about it.

Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP
and

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
D. L. Hemmenway, Senior Technical Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Philip S. Griffin
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
YUkon 6-0647

LOS ANGELES 5—3727 West 6th St.
DUNKirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JA 9-6711

DALLAS 19—2727 Oak Lawn Ave.
LAkeside 1-1266

SEATTLE 1—1008 Western Ave.
MA 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
CApitol 2-5146

Vol. 38

Contents for April 1, 1960

No. 7

Light And Power Lines..... 3

News In Perspective..... 7

MANAGEMENT / MARKETING

Management And Marketing Developments..... 45

Washington Outlook 49

Nuclear News 50

Economic Outlook 51

Nuclear Power—The Role Of The Consulting Engineer 52

Extrapolation of designs and concepts, and refinement of these designs to minimize economic penalty is a fourth role consultants must fulfill in serving his clients.

By R. H. Gordon, Project Engineer, Nuclear Engineering Division, Ebasco Service Incorporated

ENGINEERING / OPERATION

Engineering/Operations Briefs..... 55

Series Capacitors On 12-Kv Feeders—An 11-Year Record..... 56

Long experience shows efficacy of line-type series capacitors in controlling voltage fluctuations and voltage stability limit of distribution feeders.

By D. C. Keezer, Electrical Engineer, Pacific Gas & Electric Company

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75¢ per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960

POWER

OUR COVER

Artist Ted Schroeder's interpretation of the development of the modern engineer-scientist was originally created for the front cover of THE BRIDGE of Eta Kappa Nu, electrical engineering honor society, and is reproduced on our cover by special permission.

Economic Combination Of Units For Weekend Loads.... 61

Surprising rewards may result from scheduling the optimum combination of generators during this period when load is fairly uniform and period is long enough to make it practical.

By William S. Schmidt, Staff Consultant, Power Generation Department, Monongahela Power Company

The Contractor's Obligation In Safety..... 66

Contractor accident is often a public relations setback for the utility; his safety record affects his contract price.

By W. T. Rogers, Safety Director, Ebasco Services Incorporated

Industry In Conference—(Technical) 68

A report of the Pennsylvania Electric Association's System Planning Committee meeting.

MANUFACTURERS / PRODUCTS

Manufacturer's Developments 70

New Literature And New Product Briefs..... 73

New Product Design..... 76

Open Of Power..... 80

Supply Facilities 86

Calendar Of Events 90

Index To Advertisers And Their Agencies..... 90

PA Business Publication
Audit of Circulation, Inc.

NBP National Business
Publications, Inc.

**Society of Business
Magazine Editors**

Eastman Research
The Eastman Research
Organization, Inc.

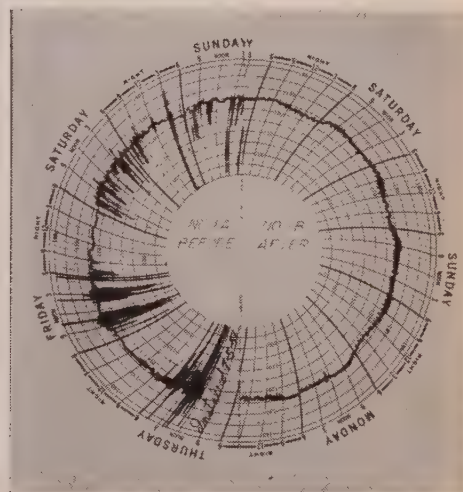


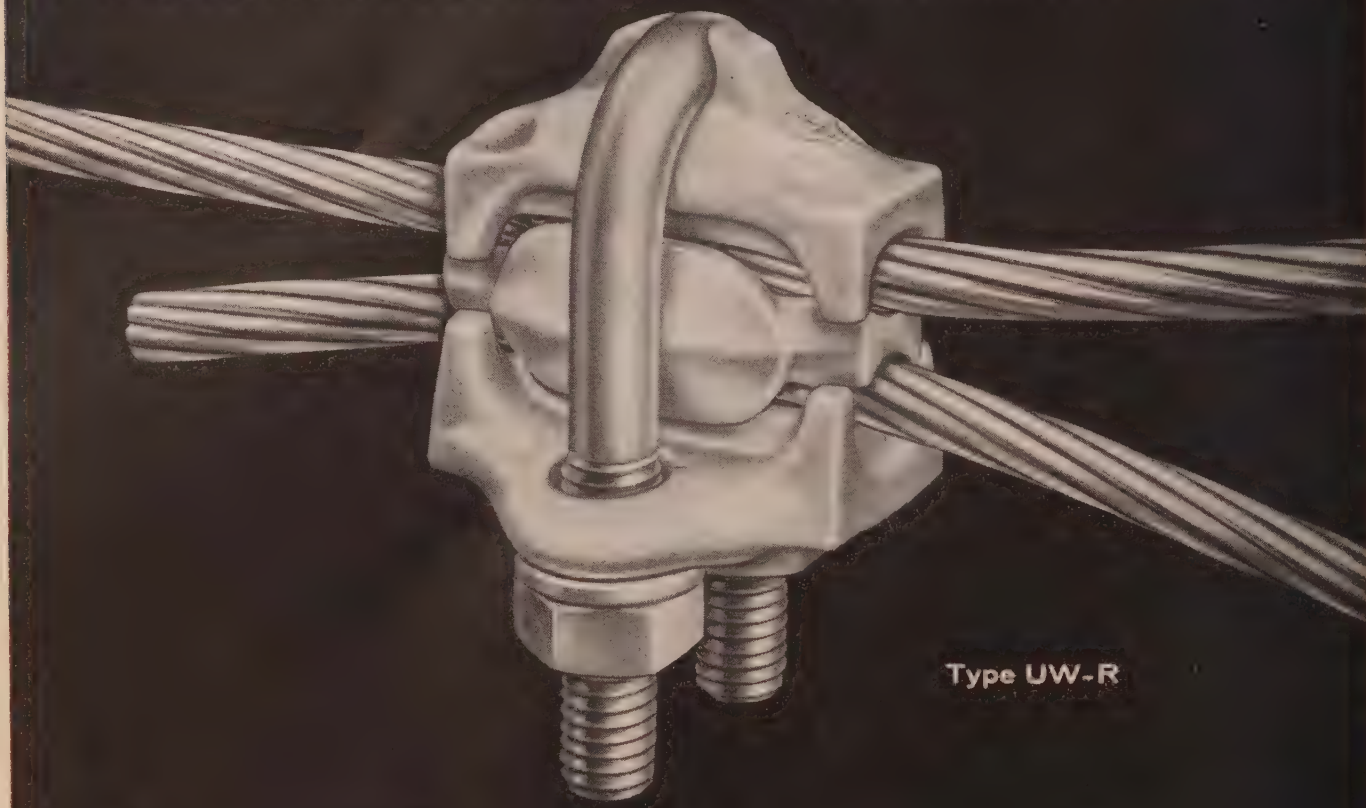
Chart shows improved voltage condition on 12-kv feeder after installation of series capacitor.



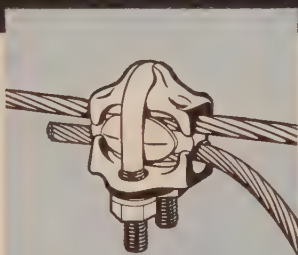
Contractor's price reflects his safety record.

CLIPIT

low cost DEADEND for ACSR and Aluminum



Type UW-R



Generous wrap-around CLIPIT spacer, coated with corrosion inhibiting compound, assures good conductivity when using CLIPIT as a tap connector

The high strength aluminum alloy CLIPIT deadend offers low cost, easy installation, wide range and versatility. For reliable field performance, the CLIPIT, type UW-R, has these engineered features:

- Wide cable range: 2 sizes cover #6 thru 2/0 aluminum or 1/0 ACSR.
- High holding strength—CLIPITS exceed rated breaking strength of ACSR on most sizes.
- All parts of the CLIPIT are mutually self aligning.
- Captured, high strength, galvanized steel U-bolt permits high tightening torque.
- Wide belled cable entrances of CLIPIT reduce stress points and minimize cold flow. Ears of caps confine cables, prevent splaying.

CLIPIT— *another engineered solution to your connector problems by*

BURNDY

BURNDY, Norwalk, Connect., or Toronto, Canada...In Europe: Antwerp, Belgium

58-13



LIGHT AND POWER LINES

There Can Be No Neutrals In The War On Accidents—"Either you help with the solution or you become part of the problem."

This thought, expressed in a recent issue of the Western Union Safety Bulletin, is an apt reminder of the great importance of keeping everyone constantly on the act," as it were, in utility efforts to prevent accidents.

As an example of this, a number of utilities have found that daily contacts between safety and claim people and publicity and information personnel is highly beneficial to all concerned. On the other hand, it has been observed that even though many utilities have found that a good accident prevention policy makes for good public relations, some do not have very close liaison between these two departments.

One evidence of an intimate working relationship of this nature is to be found in utility annual reports which include written and pictorial reference to accident prevention efforts. A recent analysis of 54 annual reports, made by Arthur Naquin, present chairman of the EEI Accident Prevention Committee, disclosed that 35 of them included both written and pictorial reference to these important efforts. Only four made neither written nor pictorial reference to accident prevention activities within their organizations.

EEI's Accident Prevention Committee is making a serious, nationwide attempt to reduce fatalities in the industry, particularly those caused by electric contacts. There are many facets to the program, one of them being the preparation of a uniform safe work practices manual.

Men who devote all of their time and talents to the prevention of accidents have found that accidents will occur after all known protective devices have been furnished, all manner of gimmicks have been

used and every practical rule has been written. In analyzing this condition, they have found that the attitude of the individual can nullify all known practices designed for the prevention of injury or death.

Attitudes can be influenced either for good or bad. Attitudes are affected by what is seen and read. The human animal is often lazy. He is also inclined to be perverse. Again, it may be a matter of mistaken effort to increase production at the expense of safety. Whatever the reason may be, a picture or story, which is different from the instructions a man has received, will be enough excuse for someone to short cut a safe practice.

All of this points up the importance of close attention by publishers of magazines serving the electric-utility field, and by those advertising therein, to the danger of inadvertently picturing practices contrary to those recommended by the EEI Accident Prevention Committee.

The year 1958 was the first which showed a material reduction in fatalities within the utility industry due to electric contacts. The problem, as recognized by the Committee, is that they have "skimmed the cream off the top." Any further reduction in the number of accidents and fatalities will require much greater effort, a much wider acceptance of responsibility, and the active assistance of everyone connected with the industry.

J. B. Garrett
Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
D. L. Hemmenway, Senior Technical Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
CEntral 6-3690

Philip S. Griffin
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
MUrray Hill 3-8432

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
PRospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
YUkon 6-0647

LOS ANGELES 5—3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JA 9-6711

DALLAS 19—2727 Oak Lawn Ave.
LAkeside 1-1266

SEATTLE 1—1008 Western Ave.
MA 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
CApitol 2-5146

Vol. 38

Contents for April 15, 1960

No. 8

Light And Power Lines..... 3

News In Perspective 7

MANAGEMENT / MARKETING

Management And Marketing Developments..... 61

Washington Outlook 65

Regulatory Review 68

Nuclear News 69

Industry In Conference 70

ENGINEERING / OPERATION

Engineering/Operations Briefs 75

Computer Automatically Assembles All
Fault-Card Data 76

Cost and time savings of computer application adequately justify program development costs.

By C. D. Alvey, Senior Engineer, Power Production Stations,
Baltimore Gas and Electric Company

A 230-Kv Innovation—Metal Crossarms On
H-Frame Line 81

On a life cost basis, study shows metal arms to be more economical; installation and operational experience shows them to be very satisfactory.

By Leslie E. Hodel, Asst. Chief of Structural Branch, Engineering Department, Portland General Electric Company

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75c per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



OUR COVER

Largest-diameter ACSR transmission conductor ever fabricated, this experimental 2.32-in. cable designed for use on Project BHV and Penelec's 460-kv test lines is here strung on Alcoa's test towers at Massena, New York. Designed by Alcoa, this test-run quantity is now being evaluated. Quantity production is expected this spring.

Painting Transformers In Place Cuts Cost 40%..... 84

Cost of replacing transformers alone is 30% more than painting in place; latter provides opportunity to inspect, prevent trouble before it starts.

By T. H. Hall, Division Superintendent, Carolina Power & Light Company, Wilmington, N. C.

Chart Simplifies Sag Computations..... 86

Adaptation of sag equations so that a single chart represents span characteristics provides a simple method for computing sags.

By A. C. Gohlke, Principal Consulting Engineer, The Cleveland Electric Illuminating Company

Are We Grounding For Least Possible Hazard?..... 88

Some new thoughts on some old and previously-accepted practices.

By H. L. Rorden, High Voltage Practices Engineer, American Electric Power Service Corporation

Utility Man's Notebook..... 91

MANUFACTURERS / PRODUCTS

Manufacturer's Developments 94

New Product Design 102

New Literature And New Product Briefs..... 103

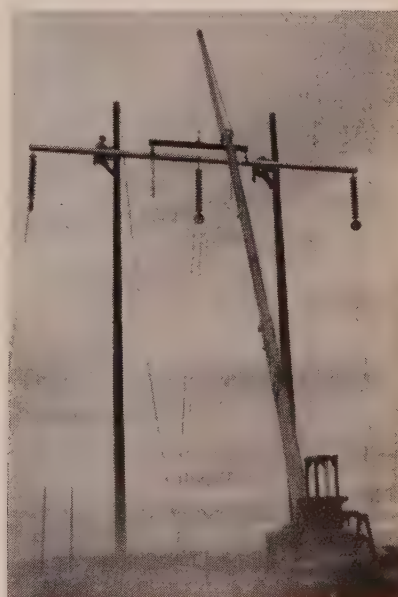
Men Of Power..... 110

Calendar Of Events 112

Index To Advertisers 112



Painting transformers in place cuts maintenance costs.



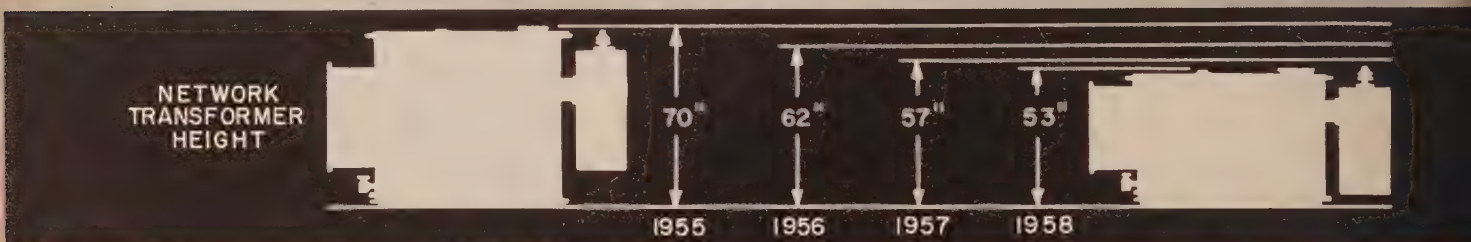
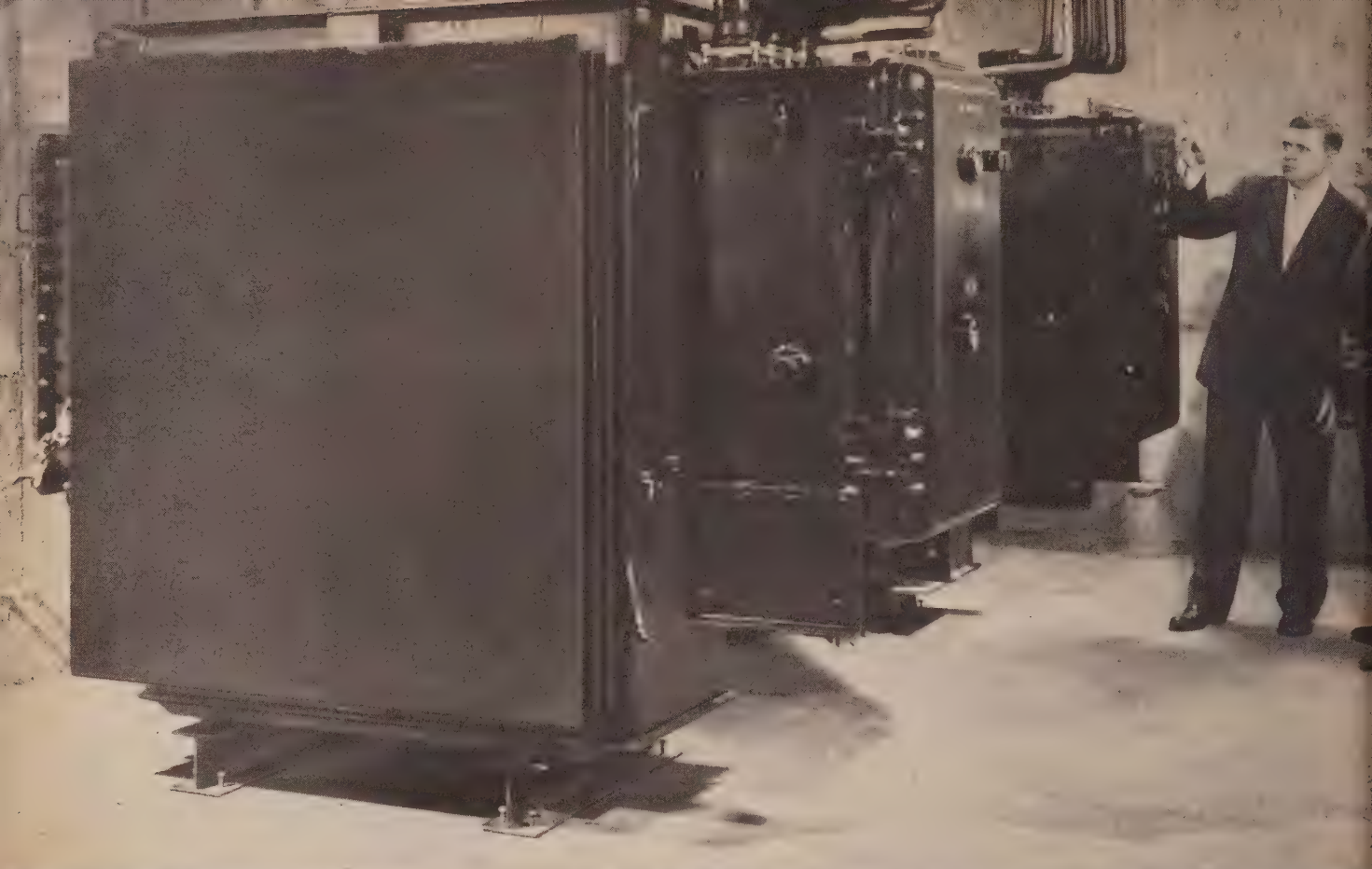
On a life-cost basis metal crossarms are most economical for 230 kv.

BPA Business Publication
Audit of Circulation, Inc.

NBP National Business
Publications, Inc.

**Society of Business
Magazine Editors**

**READERSHIP
RESEARCH** The Eastman Research
Organization, Inc.



Utility and G-E engineers inspect recent Vaultmaster transformer installation. Insert shows dramatic size reductions—totalling 24%—made on 500-kva, 15-kv network transformer since 1955.

General Electric network transformers combine new features, old reliability to pace utility requirements

Not by tradition alone has the General Electric network transformer held its unquestioned rating as the No. 1 choice of the nation's electric utilities. Utilities know that *continuous* design innovations—backed by in-service reliability—keep the G-E "Vaultmaster" ahead of the field. For example, look at these major improvements made to G-E network transformers in the past 18 months:

- **Wound Evans Core** (July, 1958)—This important development utilizes the famous G-E Spirakore* core and results in a core-and-coil that has improved characteristics, yet is smaller and lighter.

- **"Sandwich" Paint Finish** (October, 1958) Melaprene, the best paint yet found to combat corrosion damage to network transformer finish, is applied *between* the primer and finish coats to provide extra-long finish life—altogether, five paint coatings are applied compared to three coats on other network transformers.

- **Alumina Bushings** (March, 1959)—The goal of a hermetically sealed network transformer was brought one

step closer with this major advance. It eliminates the need for gaskets while reducing the throat height of the Vaultmaster unit by four to six inches.

- **Nitrile Gaskets** (November, 1959)—Both the high- and low-voltage ends of G-E network transformers are now protected by nitrile rubber gaskets—superior in sealing ability and reusable without requiring cement or other adhesive.

Thinking of a network installation this year? If so, be sure you have kept up with network-transformer advancements by keeping in touch with your General Electric Sales Engineer. Or, write for Bulletin GEA-5024 to Section 484-01, General Electric Co., Schenectady 5, N. Y.

* Reg. Trade-mark of General Electric Co.

Progress Is Our Most Important Product

GENERAL  ELECTRIC



LIGHT AND POWER LINES

Let's Make This Decade "The Electrifying Sixties"—Our industry has much to gain if every segment of it could adopt and publicize "The Electrifying Sixties" as the name for the period ahead. If this were done there is a good chance that this name would soon come into common use by people outside our industry, with obviously beneficial connotations.

Credit for this idea is due Ralph Sorenson, manager of the Utility Sales Department of Westinghouse's Electric Appliance Divisions.

Various other names now being used for the present decade, such as "The Soaring Sixties," "The Golden Sixties," and the like, portend a period of accelerated advancement and prosperity but lack the implication of electricity's role in bringing this about.

All of us have come to accept the saying, he's "cooking with gas," to express the feeling that a person is doing a good job. Thus it is not at all unlikely that "The Electrifying Sixties" could gain equally wide acceptance through united effort by our industry.

We invite comments on this idea from any of our readers and will be glad to publish them for our mutual benefit.

"Scientists Make It Known, But Engineers Make It Work"—This theme, used in a series of public service advertisements by Engineers Joint Council during last year (carried in "Editor & Publisher," business magazine for the newspaper profession), is deserving of commendation by our industry. It has served to clear confusion between the terms "scientists" and "engineers," frequently used interchangeably by news writers.

EJC's ads were designed to create better understanding

of engineers and engineering by printed media, radio and television, public officials, organizations and advertising agencies. They carried such eye-catching titles as "Let's Get Clear On What Engineers Do," "Just Who's Firing Those Missiles," and "Say Engineer When You Mean Engineer."

As one person writing to EJC in this regard commented, every engineer should become a missionary on this theme.

A Further Accomplishment Through Engineers Joint Council—Individual members of the Societies in EJC have long desired some means of knowing what EJC is doing and preparing to do in advancing the best interests of the Societies and the profession. This has now resulted in publication by EJC of "Engineer," a four-page miniature newspaper. Its Volume 1, Number 1 issue is dated "Spring, 1960."

According to EJC, this publication will be the means eventually of giving word to all engineers everywhere of the steady advancement of the engineering profession. This is a big order, when it is considered that EJC is a federation of 21 national engineering societies, representing 300,000 engineers.

Through EJC, the nation's engineers bring their constructive thoughts to bear on national manpower policy, on engineers' employment conditions in industry, on science and engineering education, on secondary and technical school education, on national resources policies, on international standards, on labor-management relations or in developments such as nuclear energy.

Our industry has a big stake in EJC's activities and its new publication should contribute importantly to our awareness and understanding of its efforts in behalf of all of us.

Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP
and

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Philip S. Griffin
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
PROspect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
YUkon 6-0647

LOS ANGELES 5—3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JA 9-6711

DALLAS 19—2727 Oak Lawn Ave.
LAkeside 1-1266

SEATTLE 1—1008 Western Ave.
MA 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
CApitol 2-5146

Vol. 38

Contents for May 1, 1960

No. 9

| | |
|------------------------------|----------|
| Light And Power Lines | 3 |
| News In Perspective | 7 |

MANAGEMENT / MARKETING

| | |
|---|-----------|
| Management And Marketing Developments | 31 |
| Washington Outlook | 33 |
| Guideposts | 34 |
| Regulatory Review | 35 |
| Nuclear News | 36 |
| Westinghouse Evaluates "New" Methods For Electric Power Generation | 37 |
| Economic Outlook | 40 |
| Industry In Conference | 41 |

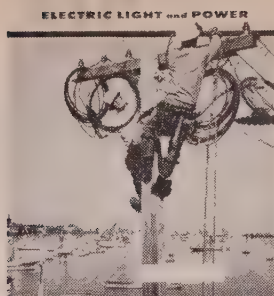
Reports of the Southwest Electric Conference and the Edison Electric Institute Sales Conference

ENGINEERING / OPERATION

| | |
|---|-----------|
| Engineering/Operations Briefs | 45 |
| Why System Measurement Is Important | 46 |
| Power factor "bird dog" var meter helps get the most for capacitor dollars. | |
| By P. C. O'Shee, Superintendent of Distribution, Alabama Power Company | |

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75¢ per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



OUR COVER

It is seldom that linemen have as picturesque a setting for their work as do these Pacific Gas & Electric Company linemen working on a pier at the Monterey, California, yacht harbor.

V"—Towers Carry Million HP Through Canadian Wilds50

Prefab aluminum towers' light weight permits airlift to remote sites, minimum installation effort, reduced maintenance.

By Hugh A. Jarman, M. S. A. E., Montreal, Canada

rogram For Planning . . . Part VI Simulated Reserve Margins Show Generation Capacity Needs52

Studies of future margins tell when a unit is needed and the risk involved in not having it on due date.

By C. J. Baldwin, Electric Utility Engineering Dept., Westinghouse Electric Corporation, and C. H. Hoffman, System Planning and Development Dept., Public Service Electric & Gas Company

lectricity Boon To Saw Mill Deep In Bush.....56

Thorough analysis of advantages of electric power convinces hard-to-sell mill operator despite high cost of line extension.

By Laurent Bosse, Consultant, Quebec Power Company

dustry In Conference.....58

Report of the American Power Conference

MANUFACTURERS / PRODUCTS

Manufacturer's Development62

ew Literature And New Product Briefs.....63

ew Product Design.....68

len Of Power70

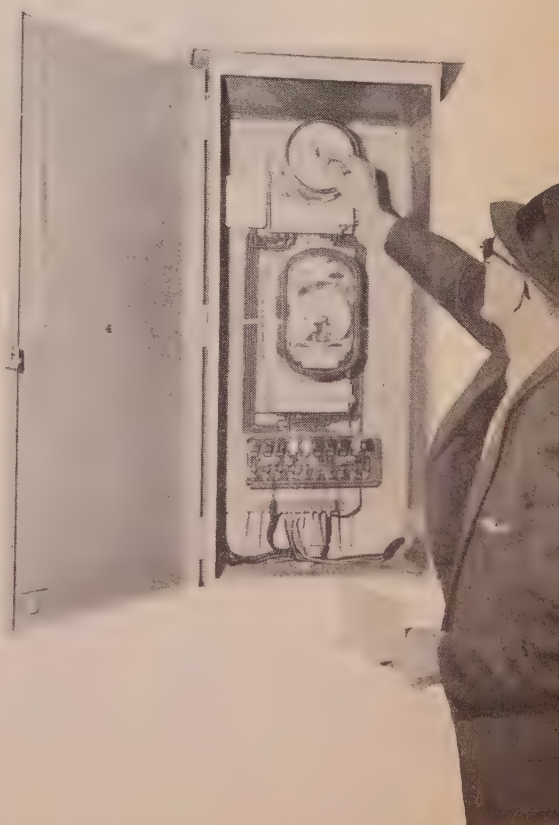
alendar Of Events72

ndex To Advertisers and their Advertising Agencies.....72



How risk deteriorates over two year period when generator is needed but not added.

"Bird Dog" var meter indicates where additional capacitors are needed and tells where too many were added by guess.



BPA Business Publication
Audit of Circulation, Inc.

NBP National Business
Publications, Inc.

**Society of Business
Magazine Editors**

**The Eastman Research
Organization, Inc.**

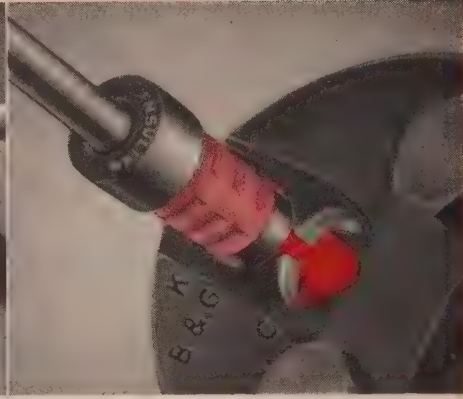
Quick... Easy... Sure



STRIP back cable insulation...arrows on INSULINK show how far.



INSERT wire ends; caps grip and hold cable, both hands are free for crimping.



CRIMP with standard compression tool... guide lines on INSULINK show where.

Pre-insulated

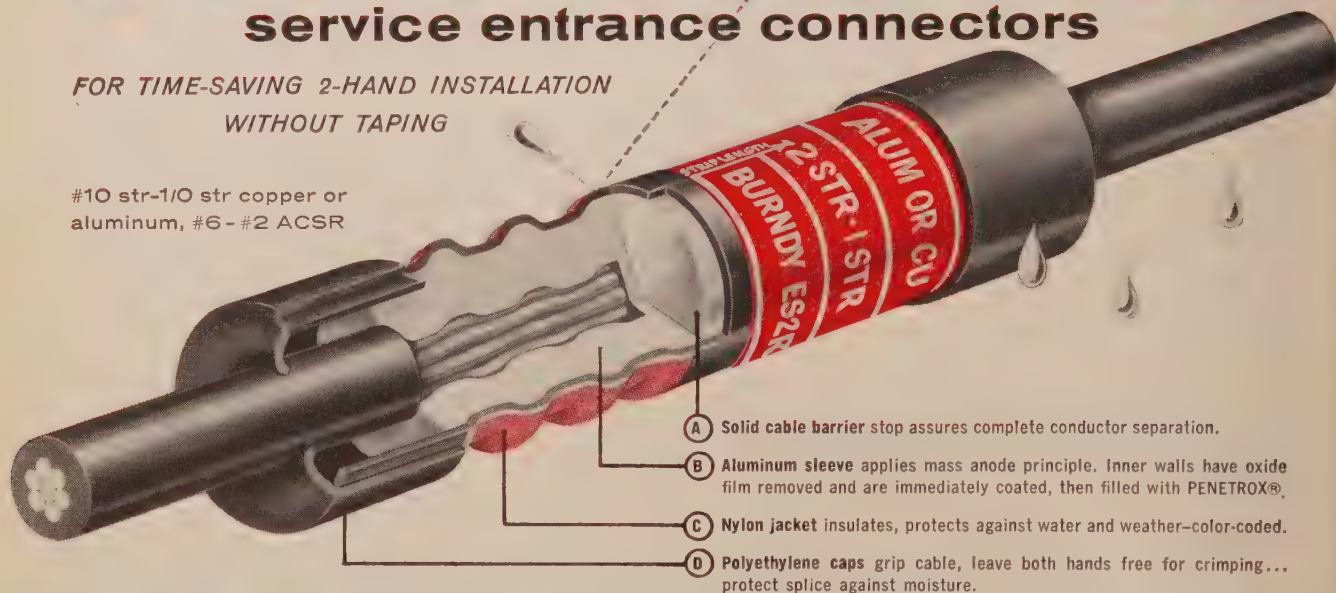
INSULINK®

Patented Other Patents Pending

service entrance connectors

*FOR TIME-SAVING 2-HAND INSTALLATION
WITHOUT TAPING*

#10 str-1/0 str copper or
aluminum, #6 - #2 ACSR



- (A) Solid cable barrier stop assures complete conductor separation.
- (B) Aluminum sleeve applies mass anode principle. Inner walls have oxide film removed and are immediately coated, then filled with PENETROX®.
- (C) Nylon jacket insulates, protects against water and weather—color-coded.
- (D) Polyethylene caps grip cable, leave both hands free for crimping... protect splice against moisture.

Connect service entrances with much less effort, in less time, **without taping**. INSULINK pre-insulated compression connectors are installed in three simple steps with the same crimping tools and dies used to install uninsulated connectors...for time-saving economy...for neat, fully protected, electrically stable connections. INSULINK connections are

QUICK: because there's no taping.

EASY: color-coded connector jacket clearly marked to show cable ranges, strip length, where to crimp. Just strip...insert...crimp; caps hold cable ends in place for simple two-hand installation.

SAFE: fully insulated to protect personnel; protected against water and weather; neat, attractive appearance.

Get the full story on **INSULINK** pre-insulated connectors from

BURNDY

Norwalk, Connecticut

In Europe: Antwerp, Belgium

Toronto, Canada



LIGHT AND POWER LINES

A Reverse Twist On The Phobia That Russia Is Out-
ing Us—We have needed an effective antidote for
vehement pronouncements that America is now or
l soon become second rate. Thanks to Bryce N.
Harlow, deputy assistant to President Eisenhower, we
now have one.

Speaking at the recent Southwest Electric Conference
in Chandler, Arizona, Mr. Harlow outlined in dramatic
fashion the contortions America would have to go
through were it to exchange places with the Soviets.
In order to enjoy the glories of the present Soviet
system, he said we would have to abandon three-fifths
of our steel capacity, two-thirds of our petroleum ca-
pacity, 95% of our electric motor output, destroy two
every three of our hydro-electric plants, and get along
with a tenth of our present volume of natural gas. We
would have to rip up 14 of every 15 miles of our paved
highways and two of every three miles of our mainline
railway tracks. We'd sink eight of every nine ocean-
going ships, scrap 19 of every 20 cars and trucks, and
shrink our civilian air fleet to a shadow of its present
size. We would cut our living standard by three-fourths,
destroy 40 million TV sets, nine of every ten telephones,
and seven of every ten houses; and then we would have
put about 60,000,000 of our people back on the farm.
And, Mr. Harlow continued, we would then, really
revel in the Soviet scheme of things, have to assume
new military problems. We'd have to accept a heavy

bomber gap, a medium bomber gap, a nuclear sub-
marine gap, a missile submarine gap, an aircraft carrier
gap, an overseas bases gap, an allies gap, and a strategic
and tactical gap. We'd see hostile troops maneuvering
in Canada and Mexico, hostile air bases humming in
Canada, Mexico and Puerto Rico, hostile missiles poised
in Canada and Mexico, hostile submarines menacingly
gliding off New York and Los Angeles, hostile aircraft
carriers prowling the Caribbeans—all armed with nu-
clear explosives of paralyzing power; and we'd have
an added discomfort—we'd know that the folks in Flor-
ida, Texas and California sullenly wished the rest of
us were dead and could hardly wait to prove it. In try-
ing to patch this up, we would have to struggle with a
hundred or so different languages, wondering all the
while how many of our soldiers would have to garrison
the homeland if a serious world crisis arose, and how
many of our troops would really perform.

In answer to the claims that the Russians are leap-
frogging us in electric power facilities, Mr. Harlow
declared that if they are to catch up with us by 1980,
they must, in the next 20 years, build the equivalent
of a brand new Hoover Dam every 21 days. They will
have the formidable task of adding 390 million kilowatts
by 1980 just to break even with America.

This compelling message merits frequent repetition
in combatting those who are all too prone to disparage
our country's strength.

John J. Garrett
Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

Vol. 38

Contents for May 15, 1960

No. 1

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Philip S. Griffin
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
YUkon 6-0647

LOS ANGELES 5—3727 West 6th St.
DUNKirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JA 9-6711

DALLAS 19—2727 Oak Lawn Ave.
LAKeside 1-1266

SEATTLE 1—1008 Western Ave.
MA 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
CAPitol 2-5146

Light And Power Lines

News In Perspective

MANAGEMENT / MARKETING

Management And Marketing Developments

Regulatory Review

Washington Outlook

Industry In Conference

Reports of the Nuclear Congress, PCEA-PCGA Administrative Services Conference.

Controlled Cooling Boosts Outdoor Fluorescent Lamp Output

Spot cooling of fluorescent street-lighting lamps improves output, permits reduction in number of luminaires.

By H. A. Van Dusen, Jr., Development Engineer, Line Material Industries

ENGINEERING / OPERATION

Engineering/Operations Briefs

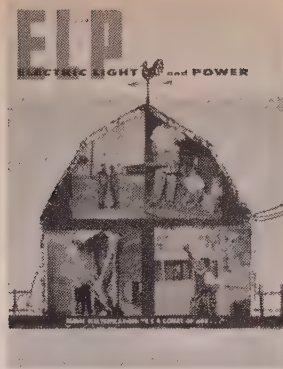
Underfrequency Relays Speed Load Recovery

Experience proves relays to be reliable, requiring little maintenance; triple frequency steps for closer load-shedding control.

By E. J. McDougall, System Operator, Florida Power & Light Company

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—\$7.00 per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



COVER NOTE

EL&P, on the 25th Anniversary of REA, salutes those who have virtually completed the electrification of America's rural areas. Design by Joe Schiavo, EL&P art director.

Phone Call Starts Britain's First Automatic Peaking Station.....102

Diesel-fueled aircraft turbine conversion, features low capital cost, instant readiness, high reliability, low maintenance, and fully automatic operation.

By J. Grindrod, Milton, Hants, England

Mobile Radio's Arms Extended By Technology, Rule Changes.....106

Advanced technology and FCC rules changes set stage for more versatile, usable systems.

By John C. Slothower, Assistant Superintendent, Transmission & Distribution, Northern States Power Company

Do-It-Yourself Meter Test Console.....110

Home-made device for special tests rewards builders from economic and operational viewpoints.

By James W. Althouse, Jr., Assistant Superintendent, Meter Division, Philadelphia Electric Company

Utility Man's Notebook.....113

MANUFACTURERS / PRODUCTS

Manufacturer's Developments.....114

New Literature And New Product Briefs.....115

New Product Design.....120

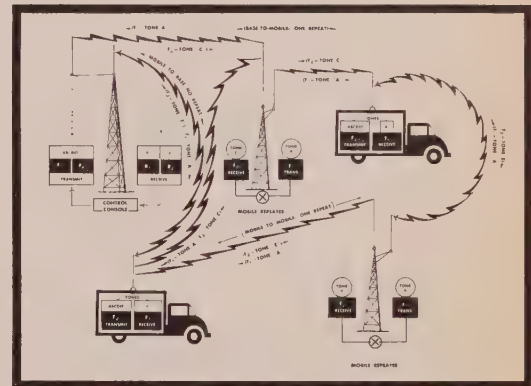
Men Of Power.....124

Supply Facilities.....127

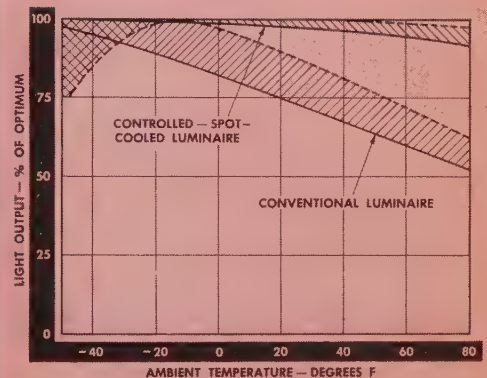
To The Editor.....131

Calendar Of Events.....132

Index To Advertisers And Their Agencies.....132



Advanced technology, plus FCC rule changes make possible expanded mobile radio operation.



Controlled cooling of fluorescent street lighting luminaires improves output, cuts overall costs.

BPA Business Publication Audit of Circulation, Inc.

NBP National Business Publications, Inc.

Society of Business Magazine Editors

READERSHIP RESEARCH The Eastman Research Organization, Inc.



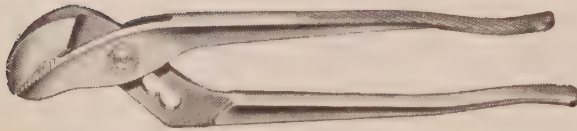
201—famous Klein Side Cutting Plier. Sizes 5, 6, 7, 8 and 9 in.

201-NE—rounded nose side cutting plier. Sizes 5, 6, 7, 8 and 9 in.

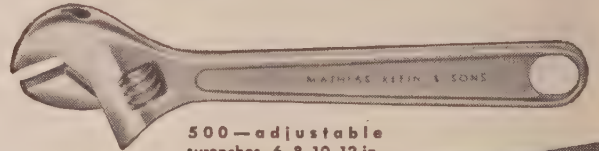
213-9NE—high leverage plier. Will cut regular and weatherproof hard drawn copper wire up to No. 2.

301—long nose plier. Available in 5-, 6- and 7-in. sizes. Also may be had with cutters.

202—narrow nose oblique cutting plier. Available in 5- and 6-in. sizes.



510—pump plier. One hand operation. Length, 9½ in.



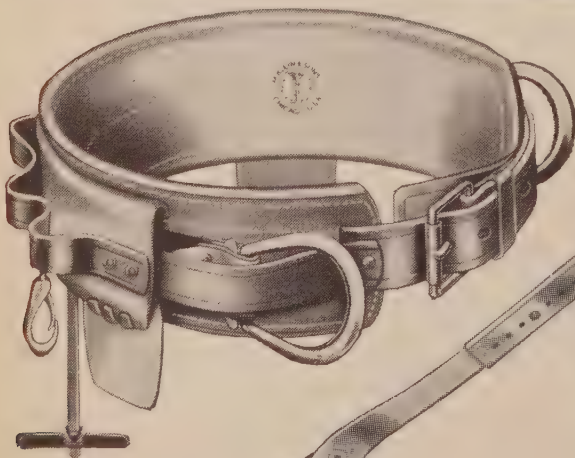
500—adjustable wrenches. 6, 8, 10, 12 in.



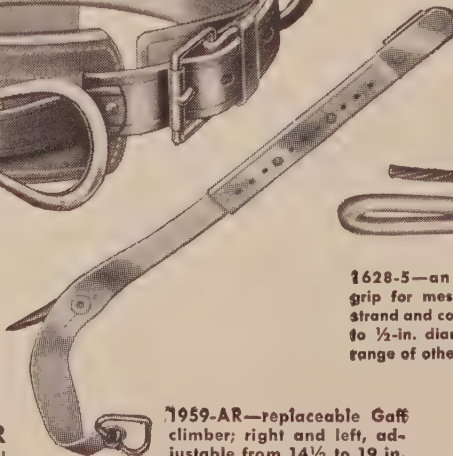
over a century of progress

Klein has been the leading supplier of tools and equipment to the electrical industry since the first wires were strung. It was over 100 years ago that Mathias Klein first opened his little forge shop in Chicago. Today the name Klein is

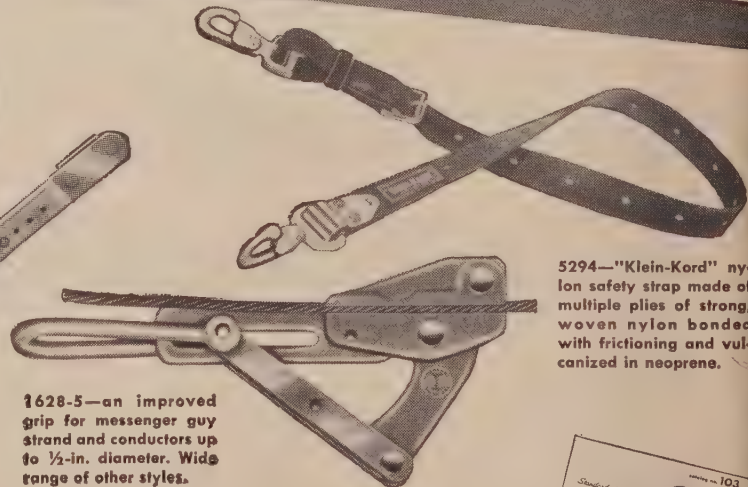
known for quality the world over. From your Electrical Distributor, you can secure anything you need in tools and equipment for linemen and electricians. Below are a few of the popular Klein items available.



5249—linemen's belt. Full floating with "Klein-Kord" sliding trace. One of a complete line.



7959-AR—replaceable Gaff climber; right and left, adjustable from 14½ to 19 in. Other designs available.

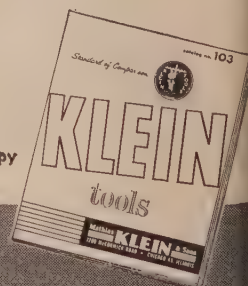


5294—"Klein-Kord" nylon safety strap made of multiple plies of strong, woven nylon bonded with frictioning and vulcanized in neoprene.

1628-5—an improved grip for messenger guy strand and conductors up to ½-in. diameter. Wide range of other styles.

ASK YOUR SUPPLIER
Foreign Distributor: International Standard Electric Corp., New York

This new Klein Catalog is just off the press. A copy will be sent to anyone interested on request.



Mathias KLEIN & Sons
Established 1857
Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS



LIGHT AND POWER LINES

Coming Up: The International Conference On Large Electric High-Tension Systems — In common with power-systems engineers throughout the world, our industry's engineers have an important stake in CIGRE's 15th biennial meeting coming up in Paris June 15-25. A sizable delegation of U. S. representatives will be in attendance and eight U. S. papers are to be presented for discussion.

A group of 19 leading U. S. authorities in power system engineering guide and direct our participation in this oldest and largest of international organizations for interchange of engineering information among nations. CIGRE was founded in March 1921 to study advances in the engineering of large high-voltage electric systems, and now has over 2400 members from 50 countries; 314 from the U. S.

During the past decade, American interest in foreign power-system developments has grown tremendously. This has manifested itself in increased foreign travel by our engineers, increased participation in international meetings, and intense interest in technical articles published in the U. S. dealing with important power-system developments in foreign lands.

As a further contribution in this field, EL&P is sending a staff editor to the CIGRE meeting, and throughout Europe, to arrange for preparation of feature technical articles to be by-lined by recognized European authorities in the electric power field, and for publication in EL&P in coming months.

"Take Another Look," and Circumvent Accidents — This admonition sets the stage for Commonwealth Edison's newly completed "home-style" movie, a strikingly effective picturization of the penalties for **not** taking another look.

Simulated reenactment of some of the all-too-prevalent types of serious and semi-serious accidents is given a dramatic touch of reality by utilizing the company's own personnel throughout the movie. Thus the under-

lying idea that "it could happen to you" is given double emphasis.

To illustrate one of the techniques used in safely simulating serious accidents, arc-welding flashes were superimposed on substation and overhead-line scenes to depict electrical flashes resulting from bodily contact with live parts. In one scene showing a worker stepping off into a momentarily unguarded opening in the floor grating of a generating station, the worker landed safely (out of camera range) in a borrowed fire-department net held by his co-workers. Of course he appeared badly injured when seen stretched out on the floor below.

Over a period of time, this unusual film will be seen by every employee of the Edison Company. It will also be used in safety training work.

The company's safety department wrote the script and directed the action. The film was professionally edited and hired equipment was utilized for the sound recording portion of the work.

Net cost to the company was only a small fraction of that of a similar commercially-produced film, not including working time of the company employees who participated. Although not available for loan to other utilities, copies of the film can be purchased from the company at \$150 each. Running time is about 26 minutes.

In the never-ending war on accidents*, this film can be a potent weapon. Moreover, the personalized approach in a safety film is one to be recommended for general adoption by all utilities.

Publisher and Editor

*See page 3 of the April 15, 1960, issue of EL&P for a companion editorial titled "There Can Be No Neutrals In The War On Accidents."



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Philip S. Griffin
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
YUkon 6-0647

LOS ANGELES 5—3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JA 9-6711

DALLAS 19—2727 Oak Lawn Ave.
LAkeside 1-1266

SEATTLE 1—1008 Western Ave.
MA 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
CApitol 2-5146

Vol. 38

Contents for June 1, 1960

No. 11

Light And Power Lines..... 3

News In Perspective..... 7

MANAGEMENT / MARKETING

Management And Marketing Developments..... 47

Economic Outlook 49

Guideposts 50

Washington Outlook 51

Regulatory Review 52

Electricity vs. Gas For Commercial Kitchens—
Which Is Best?..... 53

Selling the advantages of electricity offsets higher first cost and, in many cases, higher operating costs.

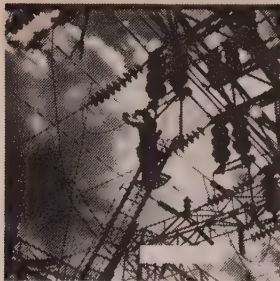
By R. L. McCuen, Commercial Sales Supervisor, Duke Power Company

ENGINEERING / OPERATION

Engineering/Operations Briefs 57

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75¢ per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois. 1960



OUR COVER

Lineman makes final connection of 138-kv line to high voltage substation in Northern Indiana. Photo courtesy of Northern Indiana Public Service Company.

POWER

Economic Conductor Sizes For Transmission Lines.....58

Simple approach to determining optimum sizes is successfully adapted for computer program.

By Henry F. Small, Senior Engineer, General Engineering Department, Consumers Power Company

How To Make Better Use Of Right-Of-Way Space.....62

Methods used by one large utility to get the most intensive use out of available space.

By E. L. Lancaster, Transmission and Distribution Engineer, Louisiana Power & Light Company

Industry In Conference.....67

Reports of the EEI Purchasing and Stores Committee, and the MVEA Engineering Conference.

MANUFACTURERS / PRODUCTS

Manufacturer's Developments75

New Literature And New Product Briefs.....79

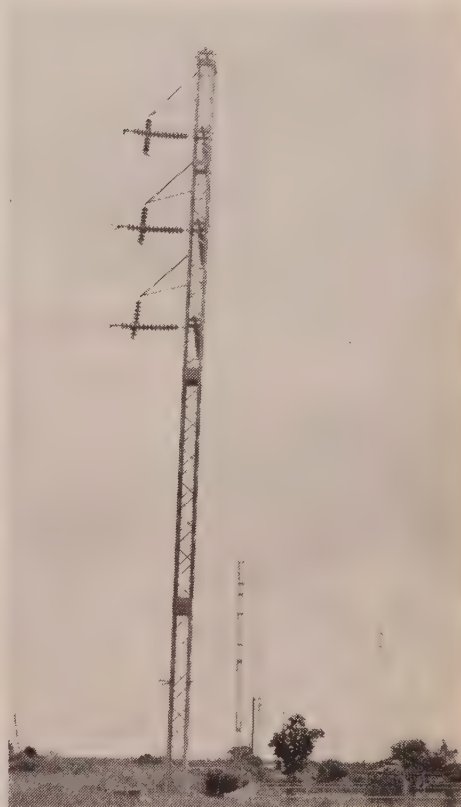
Open Of Power.....81

New Product Design.....84

Supply Facilities86

Calendar Of Events88

Index To Advertisers And Their Agencies.....88



Getting the most out of expensive rights of way involves considerations of costs, careful planning, and structure designs acceptable to adjacent property owners.

Inherent advantages of electric commercial cooking prevail over competitive fuels despite higher first costs and operating costs of equipment.



21 Years Underground

—and still as good as new!

21 years ago, the **Niagara Mohawk Power Company** specified Burndy MOLEs for their underground modernization program. Specifications called for a connector that would perform without fault, under prolonged exposure to dampness, oils, extreme temperatures, and last the life of the cables connected. The MOLEs met all specifications, and are as good as new today...proof beyond doubt that Burndy MOLEs have the high quality necessary for underground systems.

Utilities thruout the country have had similar long years of trouble-free experience with the MOLE...experience that proves that the MOLE meets underground specifications for maximum dependability.

If you are considering "going underground", or expanding your present system don't take a chance on costly burn-outs and disrupted service, call your local Burndy representative...he has had years of underground experience and can help you get maximum dependability and flexibility in your underground system.

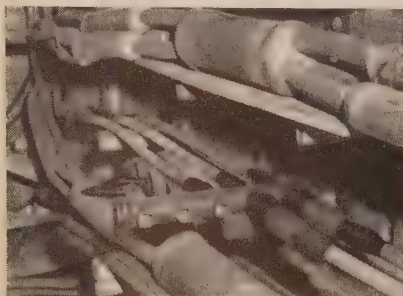


Photo from Niagara Mohawk Power's file, dated 1938, showing actual installation of MOLE in its underground system. These same MOLEs are in operation today, after 21 years of trouble-free performance.

BURNDY

ELECTRICAL CONNECTORS

Norwalk, Connect.

In Europe: Antwerp, Belgium

Toronto, Canada



LIGHT AND POWER LINES

EEI's Long Look Ahead Envisages Tremendous Growth In Power Needs—In view of this year's relative "lull" in generation additions to our nation's utility systems, can it be possible that we must add an average 18 million kw of new capacity annually for the next 20 years to achieve the 1980 total EEI now says will be required to meet our power needs at that time?

Fantastic as this prospect may appear, it has sound backing, for the results of two quite different study approaches tallied very closely. One was based on estimated loads and kwh requirements by FPC power-supply regions, and was made by a task force of utility men with years of experience in assessing power needs and supplies. The other was an EEI staff projection based on correlation studies of kwh sales and components of Gross National Product.

Based on EEI's forecast of regional generation additions for the 1960-80 period, the rate of load growth in Region Five will be greater than that of any other region in the country. This area embraces Texas, Oklahoma, Louisiana, Arkansas, Kansas, most of New Mexico, and parts of Missouri and Mississippi. Percentage-wise, this region shows a steady climb from 9% of the total generation added in 1957, to 14% in 1958, 16% in 1959, and 20.8% in the 1960-80 period.

Close behind Region 5's 75.9 million kw addition precasted for the 1960-80 period come Region 2 with 71.1 million kw, Region 3 with 66.3 million kw, and

Region 1 with 64.5 million kw. Next comes Region 4 with 41 million kw, while the Pacific and Intermountain areas combined (Regions 6-7-8) show 1960-80 additions totalling 50.5 million kw.

Further analysis of the EEI figures reveals a surprising trend in the relationship of the total generation additions in Regions 6, 7 and 8 to the additions for the entire country. Percentage-wise, this combined area has shown a steady decrease from 23% of the national total in 1957 to 22% in 1958; to 15% in 1959; and to 13.8% for the 1960-80 period. This detracts in no way from the spectacular growth in Regions 7 and 8, in particular, but attests to the tremendous magnitude of steady growth elsewhere in our country.

In making its study, EEI also took one long look beyond the 1960-80 period . . . to the year 2000. Assuming the over-all growth continues at about the same rate it has since the end of World War II, total power output by the year 2000 will probably be in the range of six to ten trillion kwh!

Of course there will be no shortage of problems which our industry must overcome in carrying out the vast expansion program envisaged by EEI, but, as EEI President Allen King says in his message of welcome to the Annual Convention, "Without problems, there would be no solutions—and no progress. A problem is frequently an opportunity, because once it is surmounted, new vistas for growth and service are opened."

Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

Vol. 38

Contents for June 15, 1960

No. 12

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Phillip S. Griffin
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
YUkon 6-0647

LOS ANGELES 5—3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JA 9-6711

DALLAS 19—2727 Oak Lawn Ave.
LAkeside 1-1266

SEATTLE 1—1008 Western Ave.
MA 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
CApitol 2-5146

| | |
|----------------------------|---|
| Light And Power Lines..... | 3 |
| News In Perspective | 7 |

MANAGEMENT / MARKETING

| | |
|--|----|
| Management And Marketing Developments..... | 73 |
| Nuclear News | 74 |
| Regulatory Review | 75 |
| Washington Outlook | 77 |
| 28th EEI Convention | 79 |
| LEADING THE WORLD IN ELECTRIC POWER— The AMERICAN Way | |

Neighborhood Service—Foundation of World Leadership • The Rural Electrification Balance Sheet • Live Better Electrically—Key to the Electrifying Sixties • Power—Its Contribution to Our Future • Electric Heat—The Big Market of the Sixties • Private Enterprise and Public Service in a Free Society • The Role of Research in the Electric Industry • “Hardhead” Engineering • America’s Power Supply Systems—Present and Future • Financing the Sixties’ Expansion Program • Free Enterprise and the Future • Safety—A Management Responsibility • Employee Relations in Perspective • Good Public Relations Must Be Earned.

ENGINEERING / OPERATION

| | |
|-------------------------------------|----|
| Engineering/Operations Briefs | 95 |
|-------------------------------------|----|

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75c per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



COVER NOTE

This painting, by Rosenfeld, was prepared for an American Electric Power information booklet. It was used by Indiana & Michigan Electric in mural size as central point in the recent Great Lakes "Business Opportunities" area development industrial exhibit. The exhibit won First Award in PUAA's Better Copy Contest.

POWER

ght Helicopter—Versatile Utility Tool..... 96

Observations of several companies indicate that these units can make important contributions in holding the line on operational costs.

onomies Of Gas Turbine For Peaking.....102

Model-system study points up advantages of applications over both short and long terms.

By J. O. Stephens, Manager, Industrial Gas Turbine Engineering, and B. L. Lloyd, Manager, Project Section, Electric Utility Engineering, Westinghouse Electric Corporation

SP's "Galloping Tester" Proves Suspension Insulators Are Rugged!.....107

Duplication of "galloping conductor" conditions on suspension insulators gives units a fast-aging workout.

By John C. Slothower, Assistant Superintendent, Transmission and Distribution, Northern States Power Company

dustry In Conference110

Reports of the EEI Transmission and Distribution Committee Meeting, and the SEE Engineering and Operation Section Conference.

MANUFACTURERS / PRODUCTS

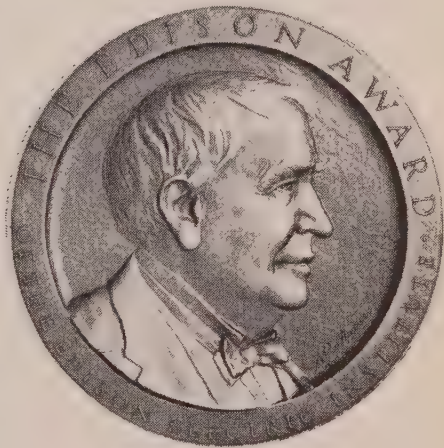
ew Product And New Literature Briefs.....119

anufacturer's Developments126

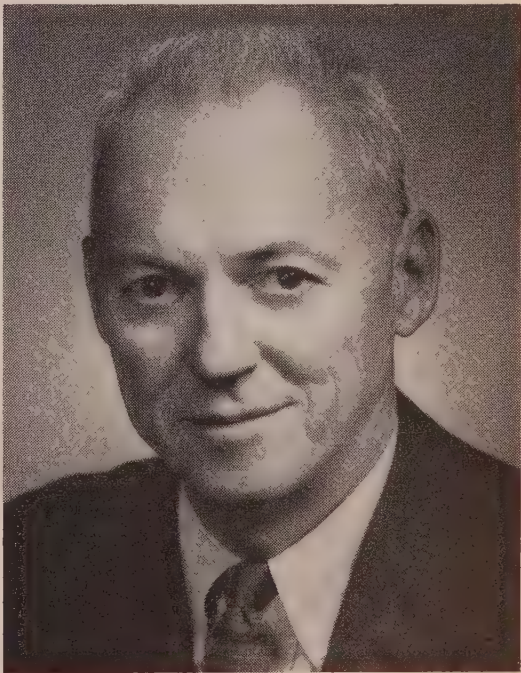
en Of Power129

ew Product Design131

Index To Advertisers And Their Agencies.....136



For news of the Edison Award Competition, see page 79



EEI elects Connecticut P & L's Sherman Knapp president for 1960

IPA Business Publication
Audit of Circulation, Inc.

NBP National Business
Publications, Inc.

**Society of Business
Magazine Editors**

**READERSHIP
Eastman
RESEARCH** The Eastman Research
Organization, Inc.

easy to string



REYNOLDS 5005

high strength, all-aluminum conductor

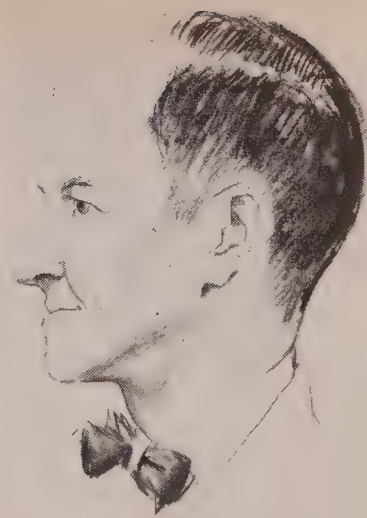
This all-aluminum conductor is easier to string, easier to handle from storage to installation because it's light in weight—has no steel core. It is also easier to splice and eliminates chance of galvanic corrosion. 5005 aluminum alloy resists rough treatment and abrasion. Economical, too—costs less than any other conductor with comparable properties. Minimum guaranteed conductivity 53.5%.

Complete data available from your nearest Reynolds branch office, Reynolds Electrical Distributor, or Reynolds Metals Company, P. O. Box 2346-EJ, Richmond 18, Virginia.



Watch Reynolds TV shows: "BOURBON STREET BEAT" and "ADVENTURES IN PARADISE"; and "ALL STAR GOLF" (resuming in October)—ABC-TV

LIGHT and POWER lines



Security Analysts View Articles In Trade Press As Measure Of Utility's Progressiveness

—It may come as a surprise to many electric-utility people to learn that security analysts pay close attention to feature articles published in power-industry magazines such as EL&P. And why do they? Simply because they are convinced that if an electric utility is truly progressive it will be evidenced by the regular appearance of by-lined articles in the industry's trade press relating its more important contributions to advancement of the industry. Utility top management can readily correct any deficiencies in this area of their operations by offering every encouragement to their key people to prepare such articles for the trade press.

One large power company places such a high value on this activity that it assigns a regular work order to preparation of each by-lined feature article, allots company time for the task, and sets a target date for its completion.

This is in vivid contrast to the utility attitude occasionally encountered that its people have no time to give to writing articles for trade magazines. Realization of the importance that security analysts attach to by-lined articles in the trade press should help to place this important activity in proper perspective.

Published Information Permits Fast Go-Ahead On Major Project

—One of the technical papers prepared for this year's CIGRE meeting in Paris brought out a point that is of extreme importance to power-system designers throughout the world.

This paper concerned the design and construction of the first 330-kv transmission system in Australia. In it the author stated that as EHV transmission is becoming more common, many of the design problems which previously required costly and time-consuming research can be solved by drawing on a large pool of accumulated knowledge.

As there was little time available for research in this instance, the design of the system was based substantially on published information, this author reported.

Benefits from published data can be far reaching, as this experience demonstrates—and our own industry's magazines render an important service in helping to disseminate the findings from important research and development efforts.

Team Approach Can Minimize Computer Problem-Solving Time

—Extremely rapid growth in our industry's adoption of computer techniques for solution of engineering-design problems has created a further problem peculiar to this important new field of endeavor—how to coordinate most effectively the work of the designer and the programmer.

It is becoming increasingly important that our engineers be able to formulate problems in the most suitable way for computer solution. Then the programmer, whose work is to plan the calculating schedule and who is familiar with the short cuts and the discriminating powers of the machine, can provide the engineer with a full set of results with minimum consumption of computer time.

Computers are so fantastically fast in making calculations that the need for saving precious seconds and minutes tends to become obscured. On the other hand, those who are working in this field are well aware of the high value of computer time.

Clearly this situation calls for special training for engineers engaged in design work requiring computer calculations. Likewise it places a premium on those who can so program the designer's problems as to maximize the efficiency of expensive computer facilities.

Teamed together, such capabilities can do wonders.

Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, *Publisher and Editor*
N. H. Jacobson, *Executive Business Editor*
K. S. Jacobs, *Managing Editor*
John T. Tyner, *Associate Editor*
R. C. Blatt, *Eastern Editor*
R. A. Lincicome, *Associate Business Editor*
R. O. McGougan, *Western News Editor*
Ralph Elliott, *Washington Editor*
E. J. Cecil, *Washington Correspondent*
A. C. Farmer, *Economic Consultant*
Edward Gordon, *MBA, Research Director*
J. J. Schiavo, *Art Director*

BUSINESS STAFF

D. M. Wulf, *Advertising Production*
William Howat, *Circulation Manager*
Marshall Haywood, Jr., *President*

BUSINESS OFFICES

CHICAGO 2-6 N. Michigan Ave.
Central 6-3690

Phillip S. Griffin
Donald R. Crane

NEW YORK 17-369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, *Vice President and Eastern Manager*
D. M. McCarthy

CLEVELAND 15-1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, *Vice President, Cleveland Manager*

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5-625 Market St.
YUkon 6-0647

LOS ANGELES 5-3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6-3217 Montrose Blvd.
JA 9-6711

DALLAS 19-2727 Oak Lawn Ave.
LAkeside 1-1266

SEATTLE 1-1008 Western Ave.
MA 3-3766

DENVER 3-620 Sherman St.
KEystone 4-4669

PORTLAND 4-404 Times Building
CApitol 2-5146

Vol. 38

Contents for July 1, 1960

No. 13

| | |
|-----------------------------|---|
| Light And Power Lines | 3 |
| News In Perspective | 7 |

MANAGEMENT / MARKETING

| | |
|---|----|
| Management And Marketing Developments | 31 |
| Economic Outlook | 33 |
| Washington Outlook | 35 |
| Nuclear News | 36 |
| Guideposts | 37 |

ENGINEERING / OPERATION

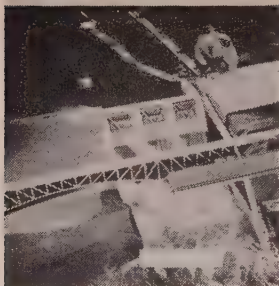
| | |
|---|----|
| Engineering/Operations Briefs | 38 |
| Model Testing At Sweden's Alvkarleby Hydraulic Laboratory | 39 |

Answers to problems confronting hydro-electric station designers are found, corrective measures taken before expensive full-scale alterations become necessary.

By Stig Angelin, The State Board of Sweden, Alvkarleby, Sweden

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75¢ per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



POWER

OUR COVER

By simulating actual operating conditions of hydro-electric plants with scale models before actual construction, Swedish engineers are able to make alterations which would otherwise be very costly either through later changes or lost efficiencies.

Control And Interlocking Of Large Gas-Fired Boiler-Turbine-Generator Units46

Automation will require closer collaboration on electrical and mechanical problems, more reliance on quality components, continuous self-checking circuitry.

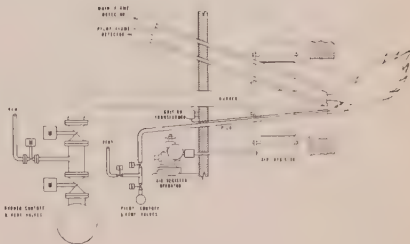
By Ludwig Skog Jr., and Edward H. Finch, Associates, Sargent & Lundy

arnell EHV Cable Tests Pass Milestone51

Cables are in; testing equipment calibration has begun; and acceptable measuring technique is under development.

Industry In Conference53

Reports of the Public Utilities Advertising Association Annual Convention, Northwest Electric Light and Power Association Business Development Conference, and the Mitchell Street Lighting Conference.



As more and more operations are taken out of the operator's hands and made automatic, it places a higher degree of reliance on quality components and continuous self-checking circuitry.

MANUFACTURERS / PRODUCTS

ew Literature And New Product Briefs61

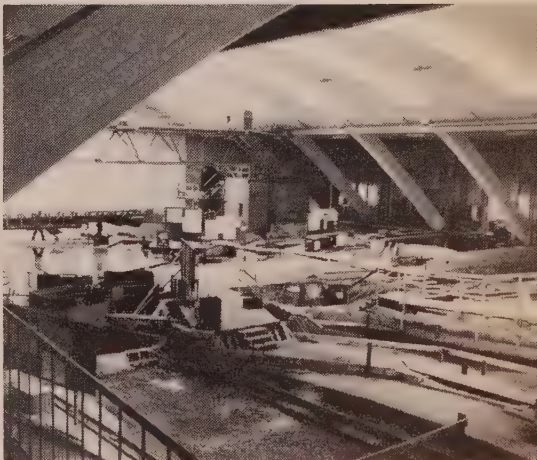
anufacturer's Developments63

ew Product Design66

en Of Power68

alendar Of Events70

dex To Advertisers And Their Agencies70



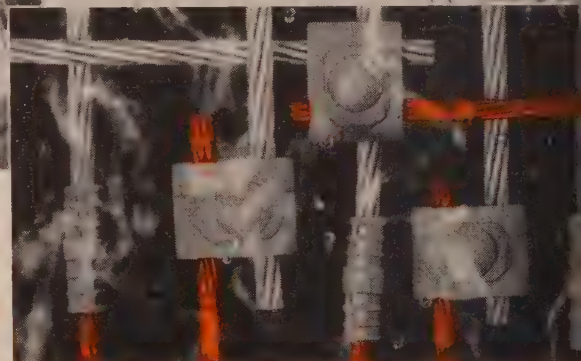
Interior view of the Hydraulic Laboratory of Sweden's State Power Board where tests show most economical solutions in new hydro-electric station design.



in the field

The Aransas Pass Test Line of Central Power & Light Co. consists of 200 foot test spans from which new tap connections are made periodically on weathered run conductor and current cycled.

...and in the lab



Inside view of a Burndy Salt Spray Corrosion Test shows what happens to connectors and cables of dissimilar metals when exposed to severe atmospheric conditions.

BURNDY RESEARCH

CONCENTRATES ON THE DEVELOPMENT OF BETTER ELECTRICAL CONNECTIONS

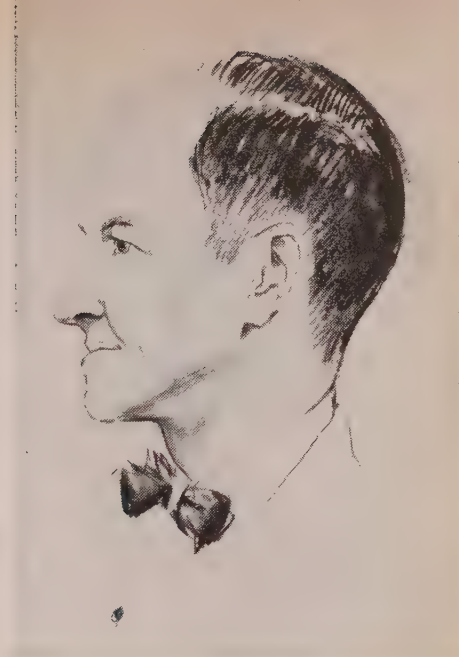
Burndy's field research with Central Power & Light on weathered overhead lines is expected to provide valuable information on connector installation practices, and possible data for the future design of connectors and cables with longer and more predictable life spans.

Burndy's research has produced: Massive Aluminum Tap—TAPIT®; Single Sleeve ACSR Splice—UNISPLICE™; Pre-insulated Service Entrance Splice—INSULINK®. Burndy research will continue to concentrate on the development of better electrical connections.

BURNDY

NORWALK, CONNECT. • BICC—BURNDY Ltd., Lancs., England • In Continental Europe: Antwerp, Belgium • TORONTO, CANADA

LIGHT and POWER lines



Radically New Departures In Energy Conversion Should Spur Student Interest In Power Field—Lack of challenge in the staid old 60-cycle power field has been held responsible for driving the majority of the more recent engineering graduates into electronic enterprises. Now that news of exploratory work in the new fields of energy conversion is crowding into the headlines, perhaps more of our engineering students will decide that exciting new challenges are still to be found in the 60-cycle power field after all.

These new technologies are destined to have a strong impact on electrical engineering educators, engineers in training, and engineers already in practice.

Dealing with the motion of charges in gases, in semiconductor solids, or in liquids, these new fields will require a better understanding of the elementary particle, in order to understand the behavior of the system or component, than ever before in electrical engineering.

Surely the new crop of engineering students will sense more real challenge in such a term as magnetohydrodynamics than in just plain old electronics!

Standardization Must Not Be Allowed To Hamper Technological Progress—When electrical-equipment design has advanced to the stage where physical components are essentially comparable, then standardization benefits everyone. But when a new scientific discovery permits a completely different design approach—and one offering greatly improved performance characteristics—then an attempt to conform to a standardized physical makeup can prevent the designer from making most effective use of new ideas and new concepts.

Occasionally a “break-through” in design dictates a radical departure from the physical makeup of a previous design. In such a case, adherence to certain standardized features can prove a stumbling block to important progress.

Equipment manufacturers make great efforts to help

establish standards and to conform to them. However, their electric-utility customers may unwittingly do a disservice to themselves if they hamstring equipment designers by insisting upon adherence to standards that are not compatible with highly beneficial departures from existing design practices.

Supersonic Reddy—There’s an interesting tale to tell about that B-58 Hustler used for testing purposes at Convair’s Fort Worth plant, where this twice-the-speed-of-sound plane is manufactured. Formerly known only as B-58 No. 25, it now has assumed its official identity as Reddy Kilowatt.

According to *TESCO Roundup*, Texas Electric Service Company’s employee publication, it all began when this company received a call from the project engineers assigned to this particular airplane. They explained that their project consisted of testing electronic systems for compatibility and operation, and asked permission to name the aircraft Reddy Kilowatt as being symbolic of the electrical devices it carries. TESCO was able to cooperate with Convair by letting the Reddy Kilowatt trademark appear on the “Hustler.”

The appropriateness of this name for the B-58 Hustler becomes more evident when it is considered that on an average demonstration flight this plane uses enough electrical power to supply an average home for an entire month.

Painted on either side of the B-58’s fuselage, the familiar Reddy carries the initials TESCO identifying him as the trademark of Texas Electric Service Company.

Flying high and fast all over the nation, Reddy also symbolizes the limitless possibilities of this electric light and power industry of ours.

Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP
and

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Phillip S. Griffin
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
YUkon 6-0647

LOS ANGELES 5—3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JA 9-6711

DALLAS 19—2727 Oak Lawn Ave.
LAKeside 1-1266

SEATTLE 1—1008 Western Ave.
MA 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
Capitol 2-5146

Vol. 38

Contents for July 15, 1960

No. 14

Light And Power Lines..... 3

News In Perspective 7

MANAGEMENT / MARKETING

Management And Marketing Developments..... 34

Regulatory Review 36

Washington Outlook 40

Nuclear News 41

Selling In The Sizzling Sixties..... 42

Bold, imaginative and consistent sales programs are needed to take advantage of the selling opportunities.

By **W. L. Byrne, Assistant Manager, Sales & Public Relations Department, Ebasco Services, Inc.**

ENGINEERING / OPERATION

Engineering/Operations Briefs 51

Changing Factors In Utility Boiler Design..... 52

Solving the problems posed by the trends to larger size and greater efficiencies promises advancement in reliability.

By **J. I. Argersinger, Chief Project Engineer, Combustion Engineering, Inc.**

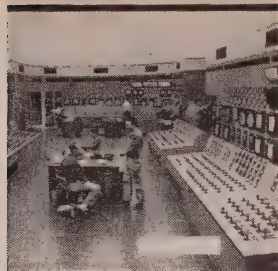
Evaluation Of Distribution Transformer Losses And Loss Ratios 56

Careful analysis will indicate any desirable change; objective should be the best compromise for all.

By **Kenneth W. Klein, Distribution Engineer, The Cleveland Electric Illuminating Company**

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75c per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



OUR COVER

Huge control room of Northern Indiana Public Service's Dean H. Mitchell Generating Station in Buffington Harbor, Gary, Indiana allows NIPSCO employees to appraise by closed circuit TV the flame in the three seven-story boilers and various remote gauges. Station is now complete. Photo courtesy NIPSCO Picture.

POWER

System Application And Control Of Kilovars 62

Maintaining high power factor throughout system provides good regulation during normal conditions; enables remaining generators to pick up var generation of machine in trouble and supplies tie-line var requirements during emergencies.

By S. H. Pollock, Principal Engineer, Kansas City Power & Light Company

Wire Shielding 230-kv Line Carries Power To Isolated Area 67

Utility energizes shield wire at 40 Kv to ground to serve ranches and small community along transmission right of way.

By D. L. Andrews, Distribution Studies Engineer, and P. A. Oakes, System Analysis Engineer, Idaho Power Company

Utility Man's Notebook 70

Industry In Conference 72

Report of the PCEA Business Development Conference.

MANUFACTURERS / PRODUCTS

Manufacturer's Developments 90

New Product Design 94

New Product And New Literature Briefs 101

To The Editor 105

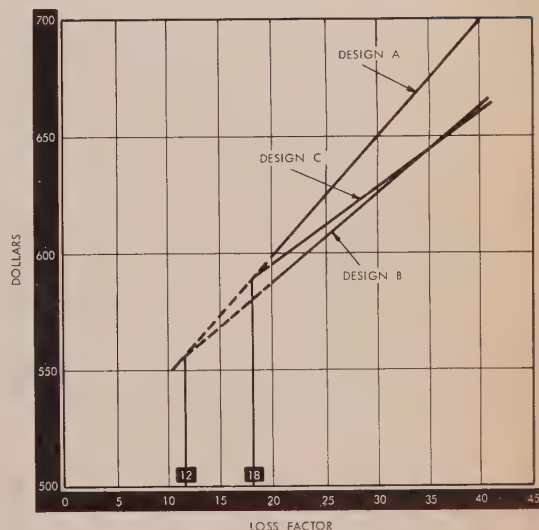
Men Of Power 108

Calendar Of Events 110

Index To Advertisers And Their Agencies 110



This Idaho Power Company 230-kv line, besides transferring bulk power over a considerable distance, serves ranches and a rural community along a 25-mile r/w via shield wire energized to 40 kv.



Effect on present worth of total annual costs for varying loss factors in distribution transformers serving the same power factor load.

GUIDED, POWER-FED AUGER GUARANTEES STRAIGHT HOLES

**takes only two controls
to put it through its paces**

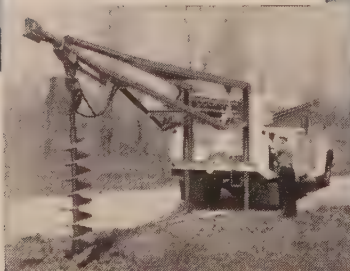
Simplicity of operation is the big difference between the Series EM-2 "Earth-Master" and ordinary hydraulic diggers which require movement of three or four levers to dig a hole of comparable size. Unlike diggers that depend on the derrick for down pressure, the frame-guided EM-2 provides direct digger control — with full power down feed exerting several thousand pounds of pressure. Auger can be reversed, run at low speed for digging or at high speed for spin-off. Installed on a live-boom derrick like the Series PM-20 "Pole-Master" shown, this portable unit provides the power and operating features of a fixed-position digger.

Digger and derrick are hydraulically powered . . . controlled independently to permit digging while pole is suspended, an especially valuable feature where cave-in is possible. Pole can be set just as soon as the hole is dug.

Twin-column telescopic frame, which stows out of the way when derrick is needed for normal hoisting, also serves as a ground prop for pole-pulling and for increased derrick capacity.



another reason why
UTILITIES EXPECT MORE FROM



SERIES DF-1 "Earth-Master"
Hydraulically-powered . . .
digs to 10' 6" deep, 9" to
20" in diameter. Shown
above on a Series PM-10
"Pole-Master" Derrick.

FOR DESCRIPTIVE LITERATURE AND PRICE INFORMATION WRITE . . .

McCABE-POWERS BODY COMPANY

5900 NORTH BROADWAY • ST. LOUIS 15, MISSOURI

625 Cedar Street 1461 E. Washington Blvd. 5525 S. E. 28th Ave.
BERKELEY 10, CALIF. LOS ANGELES 21, CALIF. PORTLAND 2, ORE.





LIGHT and POWER lines

Comfort Often Brings Complaints—About That Ridiculous "Light Bill"—A new air conditioning customer can get mighty "hot under the collar" when he receives his electric service bill following his first month of comfort-cooled, dust-free, humidity-controlled living. Electric utilities which have lived for many years without the customer bill complaints created by air conditioning use have learned how to handle them with a minimum of friction. Their experience is becoming of increasing value to other utilities as air-conditioned homes spread throughout the nation.

Prospective air conditioning customers need to know in advance that many physical conditions peculiar to their own homes, as well as their own particular mode of operation of their air conditioning equipment, can materially affect the amount of their new power bill.

Even though his air conditioning equipment is creating his interior weather, the customer frequently is unaware of the important influence of the exterior weather conditions on his operating cost. And there is a rare customer that fully realizes in advance that failure to maintain his air conditioning equipment (such as removal of dust accumulation on condenser coils) can run up his bill in alarming fashion.

It is only natural for the customer who feels that the operating cost of his air conditioning equipment is exorbitant to compare costs with those of his friends and neighbors. He needs to realize in advance that so many variable factors influence these costs as to render comparisons unrealistic. Included are such fundamental considerations as the thermostat setting and operation time.

Of course faulty installation can profoundly affect operating costs. Detection of this contributor to high operating cost can also be expensive to the utility that must come up with the answers to the customer's complaints.

Because so many factors enter into the operating cost for air conditioning, each complainant's situation

requires separate study and explanation. Perhaps some of this could be alleviated by a continuous program of pre-education directed at prospective converts to the blessings of air-conditioned living.

Make It Easy To Boost Lighting Levels When Needed—Even those who don't think they need high-level illumination in stores and offices today are most likely to find it a necessity later on. So why not be prepared to do it the easy way by designing the initial lighting installation so that more lamps and fittings can easily be added whenever required?

It seems likely that such provision for the future would not unduly burden the system to be installed to care for present needs.

The ability to go to higher lighting levels without a major upheaval, and at a more reasonable cost, should result in much earlier action to accomplish needed boosts in lighting levels than would otherwise be the case. Those who occupy the better-lighted quarters would benefit in large measure, and the utility would acquire highly desirable new load.

A Special Service That Brings Its Own Rewards—This year marks EL&P's 31st year of annual detailed reporting of industry performance in sales of major electric appliances during the preceding year, plus promotion plans of the electric utilities for the current year.

This annual report is a service EL&P is happy to perform for the industry. It could not be accomplished, however, without the continued co-operation of the utility commercial executives who contribute the data that makes this report possible.

Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

Vol. 38

Contents for August 1, 1960

No. 15

EDITORIAL STAFF

P. B. Garrett, *Publisher and Editor*

N. H. Jacobson, *Executive Business Editor*

K. S. Jacobs, *Managing Editor*

John T. Tyner, *Associate Editor*

R. C. Blatt, *Eastern Editor*

R. A. Lincicome, *Associate Business Editor*

R. O. McGougan, *Western News Editor*

Ralph Elliott, *Washington Editor*

E. J. Cecil, *Washington Correspondent*

A. C. Farmer, *Economic Consultant*

Edward Gordon, MBA, *Research Director*

J. J. Schiavo, *Art Director*

BUSINESS STAFF

D. M. Wulf, *Advertising Production*

William Howat, *Circulation Manager*

Marshall Haywood, Jr., *President*

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.

Central 6-3690

Phillip S. Griffin

Donald R. Crane

NEW YORK 17—369 Lexington Ave.

Murray Hill 3-8432

W. A. Clabault, *Vice President and*

Eastern Manager

D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.

Prospect 1-0505

Orrin Eames, *Vice President,*

Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.

EXbrook 7-5377

LOS ANGELES 5—3727 West 6th St.

DUNKirk 7-5391

HOUSTON 6—3217 Montrose Blvd.

JACKson 9-6711

DALLAS 19—2727 Oak Lawn Ave.

LAKeside 7-1324

SEATTLE 1—1008 Western Ave.

MAIn 3-3766

DENVER 3—620 Sherman St.

KEYstone 4-4669

PORTLAND 4—404 Times Building

CAPitol 2-5146

| | |
|----------------------------|---|
| Light And Power Lines..... | 3 |
| News In Perspective..... | 7 |

MANAGEMENT / MARKETING

| | |
|--|----|
| Management And Marketing Developments..... | 41 |
| Washington Outlook | 45 |
| Economic Outlook | 46 |
| Guideposts | 47 |
| Nuclear News | 48 |

| | |
|---|----|
| EL&P Thirty-first Major Appliance Survey..... | 54 |
|---|----|

Review of 1959 industry performance shows healthy gains in major appliance sales over 1958; promotional emphasis again on electric home heating.

Survey conducted by P. B. Garrett, Publisher and Editor, EL&P

| | |
|---------------------------------------|----|
| Building Load With Dehumidifiers..... | 66 |
|---------------------------------------|----|

Demonstrations and free trials help put over record campaign.

By Laurence A. Dunn, Vice President, The United Illuminating Company

| | |
|---|----|
| Modernizing College Distribution System Pays Surprising Dividends..... | 68 |
|---|----|

Installing its own distribution facilities and buying primary service will enable college to pay for system in five years with savings realized.

| | |
|-------------------------|----|
| Heating With Light..... | 71 |
|-------------------------|----|

Integrating thermal properties of lighting with air conditioning in office building proves economical.

By Joe B. Browder, Sales Manager, Georgia Power Company, and President of the Illuminating Engineering Society

| | |
|--|----|
| How Connecticut Utility Sells Private Street Lighting..... | 74 |
|--|----|

Company finds this new load builder of benefit to both itself and the customer who installs it.

By William R. Harwood, Street Lighting Supervisor, The Connecticut Light and Power Company

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75c per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960

Modern fluorescent street lighting helps provide safety through good visibility along \$12-million Vine Street extension of the Schuylkill Expressway through downtown Philadelphia. Main underpasses have between 50 and 60 fc of illumination during daylight hours for minimum eye adjustment. Photo courtesy of General Electric Company.

POWER

"Time To Change" Campaign Replaces 1034 Flame-Type Appliances..... 78

Despite arrival of natural gas in company service area, campaign aimed at conversion market topped quotas, spread to new home field.

By R. N. Robertson, Director of Residential Development, Florida Power Corporation

Whose Responsibility Is Appliance Servicing?..... 81

Manufacturers, distributors, dealers and utilities must collaborate to make servicing quick and inexpensive; utilities must fill the gap where normal channels break down.

By Fred M. Kimball, Vice President, Kansas Gas & Electric Company

How Rate Improvement Ups Appliance Sales..... 84

Three years of results shows that "all-electric" rate has materially increased sales of major appliances and all electric living.

By H. A. Stroud, Promotion Manager, Monongahela Power Company

Electric Range Promotion Sells 2138 Ranges..... 88

Free range drawings, demonstrations, sales incentives coupled with EEI and NEMA promotions sells 41 ranges per working day.

By W. S. Secrest, Advertising & Marketing Department, Houston Lighting & Power Company

Industry In Conference..... 92

Reports of the Third National Power Instrumentation Symposium of the Instrument Society of America, and Northwest Electric Light and Power Association's Accounting and Business Practice Conference.

MANUFACTURERS / PRODUCTS

New Literature And New Product Briefs..... 107

Manufacturer's Developments..... 109

New Product Design..... 113

Supply Facilities..... 118

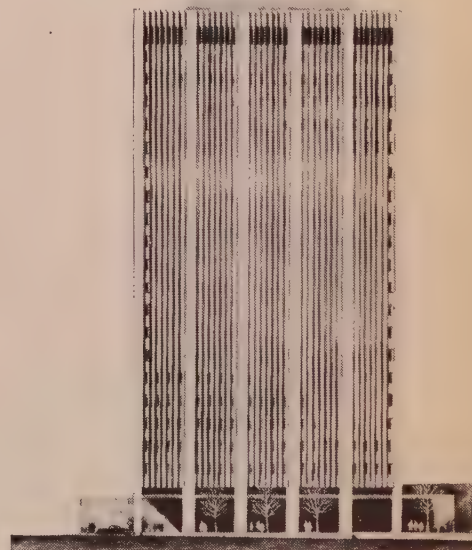
Men Of Power..... 121

Calendar Of Events..... 124

Index To Advertisers And Their Agencies..... 124



Private street lighting benefits utility and customer alike.



Office building's climate blends heat from lighting with air conditioning.



Business Publication
Audit of Circulation, Inc.



National Business
Publications, Inc.



Society of Business
Magazine Editors



The Eastman Research
Organizations, Inc.

LOW COST



REYNOLDS 5005

high strength, all-aluminum conductor



Reynolds 5005 costs less than any other conductor with comparable properties. You get lower power losses . . . improved voltage regulation . . . increased current carrying capacity. Minimum guaranteed conductivity 53.5%. And 5005 is also light in weight—stringing and handling costs are lower. It has no steel core, thus is easy to splice and there is no chance of galvanic corrosion. Complete data available from your nearest Reynolds branch office, Reynolds Electrical Distributor, or Reynolds Metals Company, P. O. Box 2346-EJ, Richmond 18, Virginia.

Watch Reynolds TV Shows: "Bourbon Street Beat"
and "Adventures in Paradise";
and, resuming in October, "All Star Golf"—ABC-TV



LIGHT and POWER lines

American Engineers Can Be A Potent Force In International Affairs

—With so many of our American engineers now returning from Europe following attendance at the CIGRE biennial meeting and the World Power Conference, this seems a good time to call some of Walker Cisler's views on the role of the American engineer in international affairs.

Speaking at an ASME luncheon, he proposed urgently that we make it possible for more American engineers to give some of their time and energy to the problems of the lesser developed nations and also to assist in the development of mutual goals in technical matters among nations that share our opportunities for leadership in the application of technology to the basic causes of human want, insecurity, and unrest around the world.

In answer to the question as to how the American engineer can find time to lend assistance in other parts of the world, Mr. Cisler observed that the problem is complicated by the fact that the more experienced he is, the more his responsibilities may keep him occupied at home. However, he said, with the use of modern transportation and communication, an engineer who is accustomed to working long and uncertain hours can accomplish a great deal in another part of the world and return to his regular duties in less time than he would devote to a routine vacation.

Mr. Cisler also expressed the belief that, from the point of view of the employer, the time is well spent because of the need for such international endeavors, as well as for the experience that he brings back with him.

It is Mr. Cisler's view that a well-balanced company

is naturally constituted in such a way that men of wide experience and important responsibility can and should be available to others who need their counsel, whether in the United States or elsewhere, for constructive purposes.

Mr. Cisler's long and distinguished participation in international engineering endeavors gives these views the great weight of deep personal conviction based on experience. No one can appreciate better than he the fact that the over-all economic and technological affairs of mankind are seriously out of balance. Or that these imbalances have resulted in tremendous and dangerous pressures that show themselves in national unrest and disturb the social, political, and economic relationships of all nations.

There are heartening signs, Mr. Cisler says, that engineers are turning their thoughts toward international endeavors. Certainly those of our American engineers who have been privileged to attend the international technical conferences have had their thoughts so oriented—and as time goes on their numbers are destined to become legion.

Working with materials, people, and money, and utilizing the essential language of the engineer that is the same the world over, our American engineers can do more to relieve the world's serious imbalances than governments and diplomats working without their aid can possibly accomplish.

Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
E. J. Cecil, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.

Central 6-3690

Phillip S. Griffin

Donald R. Crane

NEW YORK 17—369 Lexington Ave.

Murray Hill 3-8432

W. A. Clabault, Vice President and

Eastern Manager

D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.

Prospect 1-0505

Orrin Eames, Vice President,

Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.

EXbrook 7-5377

LOS ANGELES 5—3727 West 6th St.

DUnkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.

JACson 9-6711

DALLAS 19—2727 Oak Lawn Ave.

LAKeside 7-1324

SEATTLE 1—1008 Western Ave.

MAIn 3-3766

DENVER 3—620 Sherman St.

KEystone 4-4669

PORTLAND 4—404 Times Building

CApitol 2-5146

Vol. 38

Contents for August 15, 1960

No. 16

Light And Power Lines..... 3

News In Perspective..... 7

MANAGEMENT / MARKETING

Management And Marketing Developments..... 35

Nuclear News 39

Regulatory Review 40

Guideposts 41

How Market Surveys Can Help Dealers Sell..... 46

Up-to-date appliance saturation figures pinpoint local sales opportunities.

By Howard B. Hicks, Residential & Rural Sales Manager,
Carolina Power & Light Company

ENGINEERING / OPERATION

Engineering/Operations Briefs 49

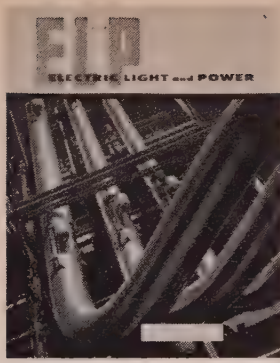
Peak-Load Energy At Low Incremental Cost..... 50

Adding peaking capability to high-efficiency reheat unit may offer advantages of low initial cost, ability to pick up load quickly, obtaining the extra capability without extra manpower.

By F. A. Ritchings, Consulting Mechanical Engineer, and
R. R. Bennett, Mechanical Engineer, Ebasco Services, Inc.

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75¢ per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



POWER

OUR COVER

Artistic pattern formed by aluminum-lagged main steam, hot reheat and cold reheat lines connecting steam generator and turbine generator at Arizona Public Service Company's outdoor-type Ocotillo Station, Unit II. Hangers supporting piping allow for its movement with temperature changes.

Versatile Mobile Test Truck Saves \$5000 Per Year..... 55

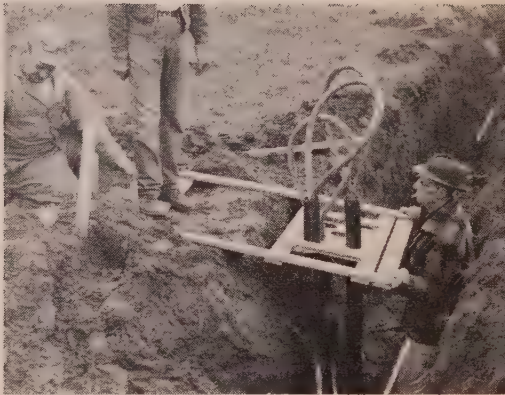
Small, maneuverable unit with its own power supply provides several advantages over previous test trucks.

By W. A. Sinclair, General Supervisor—Cable Operation, Electrical System, The Detroit Edison Company

Residential Underground Gaining Acceptance on PGE System 58

Development of pad-mounted transformer leads to installation technique economically acceptable for homes in almost any price class.

By Eric P. Verheiden, Chief Field Engineer, and Don R. Selden, Assistant Engineer, Tualatin Valley Division, Portland General Electric Company



Portland General Electric can now provide economical underground service for homes in almost any price class . . . see page 58.

Utility Man's Notebook..... 64

Industry In Conference..... 66

MANUFACTURERS / PRODUCTS

New Product And New Literature Briefs..... 77

Manufacturer's Developments 79

Supply Facilities 80

New Product Design..... 83

Men Of Power..... 87

Calendar Of Events..... 90

Index To Advertisers And Their Agencies..... 90



Detroit Edison's versatile test truck has been saving the company about \$5000 per year in cable work . . . see page 55.

INSTALL **KPF** SWITCHES WITH OR WITHOUT LINE TENSION!



KPF air break switches operate equally well with or without conductor tension—tension is not necessary to their smooth functioning. Thus KPF switches may be installed on angle poles, major crossings or other locations where separate deadends are desired. Further, their simple design eliminates lubrication or maintenance, and insures dependability under all weather conditions.

KPF switches may be installed on hot or dead lines, and are available for common voltages from 7.5 to 110 Kv.

Test KPF switches with an installation on your own system. Inquire now!

KPF ELECTRIC COMPANY



P. O. Box 1257L
Stockton, California
HOward 4-8381



LIGHT and POWER lines

Minimizing Alternative Propositions Can Save Valuable Time And Expense—Major savings in engineering man-hours and in cost to our industry can be effected by keeping to a minimum the number of alternate propositions requested in both the preliminary and final stages of bidding on major electrical apparatus.

Determination of the most economical over-all design for any major new power facility necessarily requires consideration of alternative propositions. However, there is a growing tendency to request both preliminary and firm bid proposals on a multitude of possible designs. Since each of the numerous equipment suppliers involved must work up a proposal on each of the many alternatives, the man-hours required reaches monumental proportions. And the cost to the industry mounts in direct proportion.

Utility and consulting organizations responsible for power-station design will do themselves an important service by minimizing the alternative propositions required of the equipment suppliers. Such action would enable the electrical-equipment manufacturers to utilize the valuable engineering man-hours thus saved in more creative endeavors that would bring lasting benefits to the entire industry.

Improved Store Lighting Is An Important Sales Factor But Our Industry Lacks Specific Evidence—Inquiry from an agency planning to embark upon a promotional campaign for modernization of store lighting prompted a search for specific evidence that would document its contribution to increased retail sales. It was soon discovered that such evidence is sorely lacking.

No doubt this is due in large part to the fact that better lighting is usually only one facet of a store-modernization project. This makes it extremely difficult to measure the contribution which improved lighting has made to increased sales following modernization.

On the other hand, there surely are numerous instances where only the store's lighting system has been improved. Such cases could provide valuable data for promotional purposes if special efforts were made to obtain and publicize the "before and after" story, both in data form and pictorially.

It is to be hoped that everyone in our industry will keep this need in mind when future projects develop which involve only improved store lighting. Then if this information is made available to all who work in this field, through publication in our trade press, important benefits will accrue to our electric utilities, as well as to our lamp and fixture manufacturers.

Drat Those Hum-Bugs!—One of Florida's island preachers is reported to have come up with an amusing theory about the appeal that power poles have for oversized pileated woodpeckers.

After long observation, he has concluded that these birds "hear the humming of the wires, think it's bugs in the poles and go after them."

In any case, "hum-bugs" can be a mighty handy name for whatever it is they seek so diligently, and with such destructive consequences.

Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

and

ELECTRIC LIGHT

Vol. 38

Contents for September 1, 1960

No. 17

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
Ephriam Kahn, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690
Phillip S. Griffin
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
EXbrook 7-5377

LOS ANGELES 5—3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JAckson 9-6711

DALLAS 19—2727 Oak Lawn Ave.
LAkeside 7-1324

SEATTLE 1—1008 Western Ave.
MAin 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
CApitol 2-5146

Light And Power Lines..... 3

News In Perspective..... 7

MANAGEMENT / MARKETING

Management And Marketing Developments..... 31

Nuclear News 34

Washington Outlook 36

Economic Outlook 38

Electricity Takes Over In Heating Caustic Solution..... 40

Application of electricity to special processing revolutionizes a small Canadian industry.

By Andre Martel, Commercial and Industrial Representative, The Shawinigan Water and Power Company

ENGINEERING / OPERATION

Engineering/Operations Briefs 42

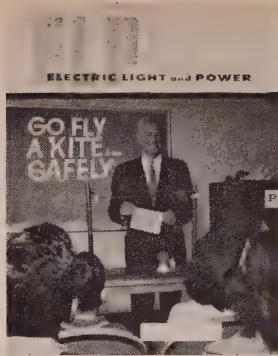
Economic Pool Dispatch Without Central Control..... 43

Buying and selling economy power via "ticker tape" quotations provides pool benefits to five Iowa companies.

By L. L. Linder, System Operator, Iowa Southern Utilities Company

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75c per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois. 1960



OUR COVER

Lessons in kite flying are taught groups of school children in Pacific Gas & Electric Company territory by means of this demonstration unit. The demonstrator burns up a model kite on a model transmission line, chars a piece of raw meat with electricity, and creates a loud explosion (from a capacitor discharge) when metallic kite string shorts the line.

Successful Past Marks Edison's Newly-Assigned Desert Territory 47

Utility shows confidence in once waste area by providing service facilities to help reclaim it.

When To Treat Southern Pine Poles 50

Comprehensive ground-line inspection program reveals most rejections to be a result of groundline failure; economics point to ground-line treatment to avoid annual costs associated with replacement.

By Wayne H. Johnson, Head, Distribution Engineering Section, American Electric Power Service Corporation

Special Design Characterizes Terminals For Distribution Transformers 52

Development and tests of distribution transformer pushing terminals suitable for both aluminum and copper conductors indicate that a universal terminal can be designed to meet requirements.

By Truman B. Shaw, Senior Engineer, Anderson Electric Corporation

MANUFACTURERS / PRODUCTS

Manufacturers' Developments 71

Supply Facilities 73

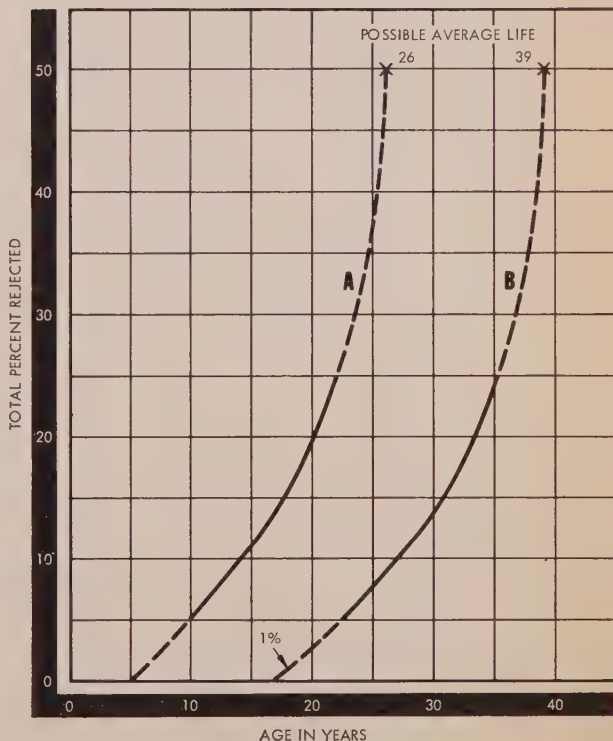
New Literature And New Product Briefs 75

New Product Design 77

Man Of Power 81

Calendar Of Events 84

Index To Advertisers And Their Agencies 84



Ground-line treatment of poles should begin far enough in advance of the one-percent rejection rate to avoid replacements . . . See page 50.



Utility helps transform new desert service area into useful, productive and desirable lands . . . See page 47.



Bethanized Strand protects Niagara Mohawk line

Here is part of a 47-mile transmission line near Buffalo, built recently for Niagara Mohawk Power Corporation. Because the line traverses an industrial area, Bethanized "C" coated strand was selected for overhead ground wires. The ground wire, manufactured to ASTM Specification A-363, is $\frac{7}{16}$ -in. 7-wire extra-high-strength strand.

With Bethanized strand, you can select from four coating weights to provide adequate protection against corrosion. The coating is applied by Bethlehem's special electrolytic process which makes possible a uniform, tightly bonded zinc coating that is 99.9 pct pure.

The "A" coating weight is intended for service where atmospheric conditions are good. The "B" coating contains twice, and the "C" coating three times, the weight of the "A" coating. The "D" coating, which comes in common, Siemens-Martin and high-strength grades, contains four times the weight of the "A" coating. If you would like to have full details, write to the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation



for strength
... economy
... versatility

BETHLEHEM STEEL





LIGHT and POWER lines

Air Pollution Control Progress Lacks Public Ap-

preciation—One of the most disheartening aspects of work in the field of air pollution control is the seeming lack of appreciation on the part of the public of the efforts the electric utility industry is making and the progress attained. This is the view which was expressed by George Minasian, Con Edison's Director of Community Relations, when he addressed the recent Air Pollution Control Association annual meeting.

Mr. Minasian also said he is quite convinced that there is only one sure-fire way of getting the story of the industry's efforts in this field across to the public, and that is through personal visits to power-generation plants by civic groups, political leaders, educators and even those individuals who take only a personal interest in their local conditions.

In his address, Mr. Minasian also cited a number of figures which suggest the possibility of publicizing the factual side of the story in a way that would capture public attention.

Examination of the data he presented reveals that the utilities exercised no control of flyash there could be as much as 12 million tons of it dropping on the ground annually (on a national basis)—nearly 33,000 tons a day!

It would seem that the public could also appreciate the \$350-million figure he gave for total expenditures of the industry since World War II for air pollution control.

Possibly in some way the public could also be made to understand and appreciate the further point that Mr. Minasian stressed that air pollution control represents an investment on the part of the utility of about \$100 for each kw of customer demand. (This is based on today's cost of about \$5-million for a combined mechanical and electrostatic installation for a 360-mw unit.)

Our electric utilities have invested so much time, effort and money in control of air pollution that they are fully deserving of public approbation. But it is apparent they will have to blow their own horns long and loud to win the approbation they deserve from the public they serve.

NSP Lights Up Dark Corners With Its New "Night-watch" Service—For a net cost of only \$3.25 per light per month, customers of the Northern States Power Company can now enjoy and profit from illumination of dark spots in residential yards, farm yards and recreational, commercial and industrial areas. This low cost includes installation, maintenance and electricity consumed by the unit.

Under this new service, NSP installs an extra-high-output fluorescent floodlight on any existing Company pole. Farmers may also have the 4-ft-long, 6900-lumen units installed on their own yard poles.

Light from the unit (usually mounted at heights from 20 to 26 feet above ground) can be aimed at a specific area. Photocell control turns it on at dusk and off at daybreak.

NSP "Nightwatch" service provides more security for commercial and industrial customers and home owners against vandalism, pilfering and burglary. It also provides greater safety and improved conditions in areas where work is done after dark.

This appears to be an idea from which everyone gains and no one loses. Thus it should have universal appeal for all electric utilities and their customers.

Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging



ELECTRIC LIGHT

EDITORIAL STAFF

- P. B. Garrett, *Publisher and Editor*
- N. H. Jacobson, *Executive Business Editor*
- K. S. Jacobs, *Managing Editor*
- John T. Tyner, *Associate Editor*
- R. C. Blatt, *Eastern Editor*
- R. A. Lincicome, *Associate Business Editor*
- R. O. McGougan, *Western News Editor*
- Ralph Elliott, *Washington Editor*
- Ephriam Kahn, *Washington Correspondent*
- A. C. Farmer, *Economic Consultant*
- Edward Gordon, *MBA, Research Director*
- J. J. Schiavo, *Art Director*

BUSINESS STAFF

- D. M. Wulf, *Advertising Production*
- William Howat, *Circulation Manager*
- Marshall Haywood, Jr., *President*

BUSINESS OFFICES

- CHICAGO 2-6 N. Michigan Ave.
Central 6-3690
Phillip S. Griffin
Donald R. Crane
- NEW YORK 17-369 Lexington Ave.
Murray Hill 3-8432
W. A. Clabault, *Vice President and Eastern Manager*
D. M. McCarthy
- CLEVELAND 15-1836 Euclid Ave.
Prospect 1-0505
Orrin Eames, *Vice President, Cleveland Manager*

WEST COAST REPRESENTATIVE

- McDonald-Thompson Co.
- SAN FRANCISCO 5-625 Market St.
EXbrook 7-5377
- LOS ANGELES 5-3727 West 6th St.
DUnkirk 7-5391
- HOUSTON 6-3217 Montrose Blvd.
JACKSON 9-6711
- DALLAS 19-2727 Oak Lawn Ave.
LAKESIDE 7-1324
- SEATTLE 1-1008 Western Ave.
MAIN 3-3766
- DENVER 3-620 Sherman St.
KEYSTONE 4-4669
- PORTLAND 4-404 Times Building
CAPitol 2-5146

Vol. 38 Contents for September 15, 1960 No. 18

| | |
|----------------------------|---|
| Light And Power Lines..... | 3 |
| News In Perspective..... | 7 |
| Marketing Guideposts | 8 |

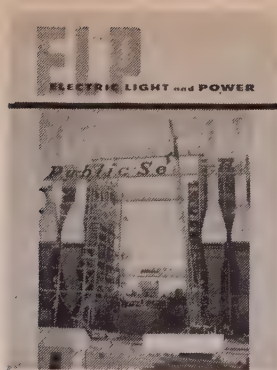
MANAGEMENT / MARKETING

| | |
|---|----|
| Management And Marketing Developments..... | 43 |
| Nuclear News | 45 |
| Washington Outlook | 47 |
| Regulatory Review | 48 |
| Plant Dedication Adds New Dimension To Utility-Community Relations..... | 56 |
| Planning with community welfare in mind enables utility to gain new high in recognition as good neighbor | |
| Utility Teams Up With Textile Firm To Boost Power Use..... | 58 |
| Using one load builder as incentive to sell another results in successful promotion, volume sales. | |
| By Howard R. Gravatt, <i>Coordinator of Dealer Promotions, Long Island Lighting Company</i> | |

ENGINEERING / OPERATION

| | |
|---|----|
| Engineering/Operations Briefs | 59 |
| 138-Kv Substation Redesign Brings Installation \$ Down 60 | |
| Engineering-economic studies enable designers to effect economies in several construction areas. | |
| By Paul M. Black, <i>Specifications Engineer, Distribution Engineering Department, and Jack C. Foss, Section Engi- neer, Station Electrical Engineering Department, Common- wealth Edison Company</i> | |

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75c per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.



OUR COVER

Letters 8-ft tall, identifying Arizona Public Service Company's Ocotillo Power Plant near Tempe, swing into place between towering boiler structures.

Feeder Voltage Calculations..... 64

Nomogram simplifies determination of voltage and load at any point on a feeder.

By R. A. Dewberry, Distribution Engineer,
Montana-Dakota Utilities Company

Graph Simplifies Determination of Economic Conductor Size..... 66

New approach to graphic representation provides answers with minimum of computational effort.

By M. G. Rekoff, Jr., Assistant Professor of Electrical Engineering, The A & M College of Texas

Remote Outage Locators After Three Years..... 68

Both equipment and operating rules will need some changes if device is to find its place as essential tool.

By John C. Slothower, Past Chairman, National Committee For Utilities Radio

Single-Pole Disconnect Switch Tests Determine Looped-Circuit Break Capacity..... 71

Since these units are frequently called on to break load on a looped circuit, it is well to know their capability.

By T. E. Curtis, Chief Engineer, Electrical Apparatus,
A. B. Chance Company

Utility Man's Notebook..... 72

MANUFACTURERS / PRODUCTS

Manufacturer's Developments 87

New Product And New Literature Briefs..... 91

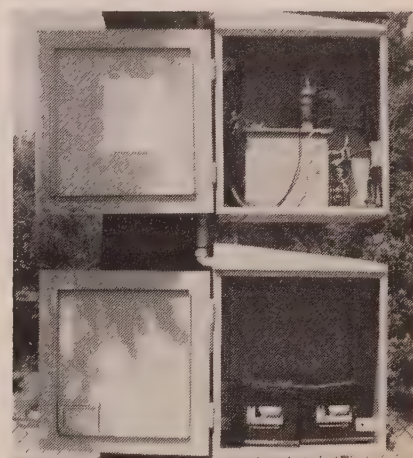
New Product Design..... 93

Supply Facilities 101

Men Of Power..... 104

Calendar Of Events..... 108

Index To Advertisers And Their Agencies..... 108



Mixed opinions from use of remote outage locators . . . see page 68



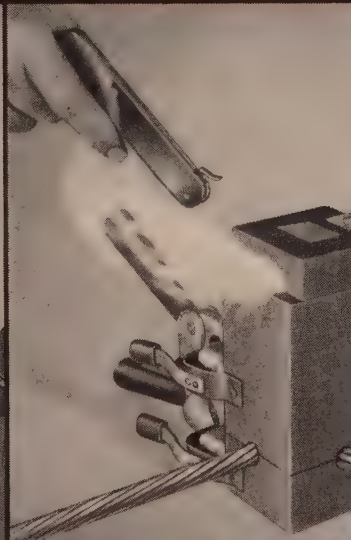
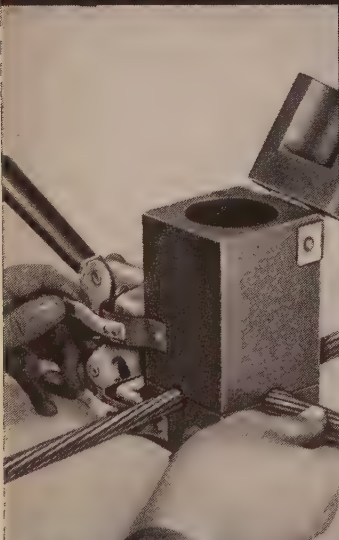
Commonwealth Edison studies point way to greater substation economies . . . see page 60

Now you can weld a perfect, permanent electrical connection every time with

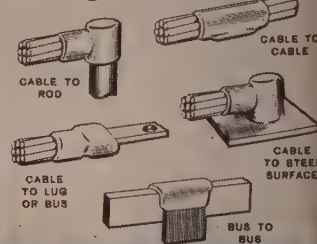
BURNDY thermOweld

*... connects easily
and economically
to any copper
conductor or
steel structure*

Get a permanent THERMOWELD connection quickly...never corrodes or loosens, costs little to install. Current-carrying capacity higher than conductors.



You can THERMOWELD almost all steel or copper connections, including...



Weld anywhere, to cable or flat, with this compact, lightweight THERMOMOLD. Completely self-contained... needs no external source of power, no special skill.

Pour welding powder into mold, tap to release starting charge. Unique composition of starting charge prevents mixing with welding powder, assures positive firing. Slag easily removed.

Close cover and ignite charge with flint gun. Fast-burning powder fires every time. THERMOWELD reaction forms liquid copper which fuses conductors into a solid copper mass.

THERMOWELD fires every time. Cartridges sealed in polyethylene envelopes with moisture absorbing silica gel. Starting, welding charges can't mix...full starting charge assures ignition.

All components are available from your local Burndy distributor. Ask him or your Burndy representative for a demonstration.

BURNDY

Norwalk, Connect.

In Europe: Antwerp, Belgium

Toronto, Canada



LIGHT and POWER lines

fall prey to the sometimes illusionary attraction of short-term benefits for anyone.

Are Our Manufacturers' Profit Margins Approaching The Vanishing Point? If So, Something's Got To Give!—What is it going to be? A letdown in quality? slowdown in new developments? Or both?

Though this is not a new threat, it is a periodically renewed one. And, for some time now, reports reach us that the plight of many suppliers is serious enough again to demand the concern of responsible people in an industry which requires a unique measure of dependability and continuity.

If pencil sharpening in utility purchasing becomes severe enough—and it may be, even now—the consequences suggested above can and probably will happen. If they do, the ones who will be literally holding the bag are the electric utilities. Unfortunately, too, the threat is to the industry, not just the utilities whose officials take the short-sighted view, reversing the trend from "Value Analysis" to purchasing on price alone.

First will come a rash of equipment troubles that can have serious repercussions on service to utility customers. Then—as more time passes—will come pressing need for equipment to meet new system requirements; equipment that will be still only a dream in the eye of the development engineer because profits were lacking to plow back into research and development.

Manufacturers who have a wide diversity of products and who supply other industries as well as our own naturally have a better chance of keeping going without a letdown for a considerable period of time; but what about the more numerous manufacturers who are not as fortunate and yet are so essential to the continued progress of our industry.

Admittedly there are many facets to this problem and many areas for argument and disagreement. But one thing is certain—the quality of today's equipment and the creation of the equipment our industry must give to meet future needs must not be allowed to

Electric Power's Importance To 20th Century Life—Everyone directly concerned with our electric light and power industry is well aware of the more obvious effects that prolonged power interruptions can have on city life. But are we equally cognizant of many less obvious after-effects?

Some of these have been given dramatic emphasis in a recent issue of "Kaiser Aluminum News" in a feature presentation titled "The City That 'Died' In Its Sleep."

On the supposition that service could **not** be restored following a disastrous power interruption, such rather unanticipated consequences as these are cited:

"Many services would become unobtainable. Prescriptions for eye-glasses could not be ground without power to turn the grinding machines. Shoes could not be repaired for the same reason. Dentists could perform only those operations that require no drilling. Doctors would be reduced to improvising new methods for sterilizing instruments.

"Water would become scarce, once it drained from the mains. There would be no pumps operating to refill them. Without water, plumbing wouldn't work, and it wouldn't matter if it did, since there would be no pumps working to move the sewage from the basins to the sewage-treatment plant. There would be no laundries nor dry-cleaning plants operating to take care of dirty clothes; no water nor power to wash them with at home."

For most citizens, life would be reduced to a level they had never experienced before.

Although we can bolster our spirits with the thought that power supply is almost always restored in very short order now, there remains a very heavy responsibility on our industry. We cannot afford any letup in our striving for even better continuity of service than is provided now.

Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP
and

ELECTRIC LIGHT

Vol. 38

Contents for October 1, 1960

No. 19

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor

N. H. Jacobson, Executive Business Editor

K. S. Jacobs, Managing Editor

John T. Tyner, Associate Editor

R. C. Blatt, Eastern Editor

R. A. Lincicome, Associate Business Editor

R. O. McGougan, Western News Editor

Ralph Elliott, Washington Editor

Ephraim Kahn, Washington Correspondent

A. C. Farmer, Economic Consultant

Edward Gordon, MBA, Research Director

J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production

William Howat, Circulation Manager

Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2-6 N. Michigan Ave.

Central 6-3690

Phillip S. Griffin

Donald R. Crane

NEW YORK 17-369 Lexington Ave.

Murray Hill 3-8432

W. A. Clabault, Vice President and

Eastern Manager

D. M. McCarthy

CLEVELAND 15-1836 Euclid Ave.

PRospect 1-0505

Orrin Eames, Vice President,

Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5-625 Market St.

EXbrook 7-5377

LOS ANGELES 5-3727 West 6th St.

DUNKirk 7-5391

HOUSTON 6-3217 Montrose Blvd.

JACKson 9-6711

DALLAS 19-2727 Oak Lawn Ave.

LAkeside 7-1324

SEATTLE 1-1008 Western Ave.

MAIn 3-3766

DENVER 3-620 Sherman St.

KEystone 4-4669

PORTLAND 4-404 Times Building

CApitol 2-5146

| | |
|------------------------------------|----------|
| Light And Power Lines | 3 |
| News In Perspective..... | 7 |

MANAGEMENT / MARKETING

| | |
|---|-----------|
| Management And Marketing Developments..... | 39 |
| Washington Outlook | 43 |
| Nuclear News | 44 |
| Economic Outlook | 46 |
| U. S. Savings and Loan League Reports: What Key Lending Officers Think of Electric Heating | 52 |
| By Norman Strunk, Executive Vice-President, United States Savings and Loan League | |

ENGINEERING / OPERATION

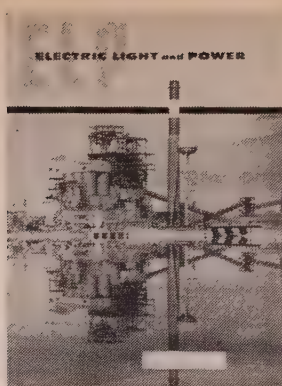
| | |
|---|-----------|
| Engineering/Operations Briefs | 55 |
| Computer Control Promises Cut In Generation Costs..... | 56 |

Application of the digital computer as a practicable control device presents the designer with a new avenue for improvement.

By A. L. Guidero, Senior Mechanical Engineer, Southern California Edison Company

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75¢ per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



OUR COVER

Pacific Power & Light Company's 100,000-kw Dave Johnston steam plant near Glenrock, Wyoming, is duplicated by reflection on cooling water forebay; plant is scheduled to be actually doubled in size by year's end.

Good Structural Practices, Not Pounds, Should Dictate Transmission Tower Design..... 62

Towers must stand up to realistic loading conditions, many of which are not covered by the NES Code.
By J. R. Arena, Structural Engineer, Sargent & Lundy

Pakistan Pushes Power Development..... 64

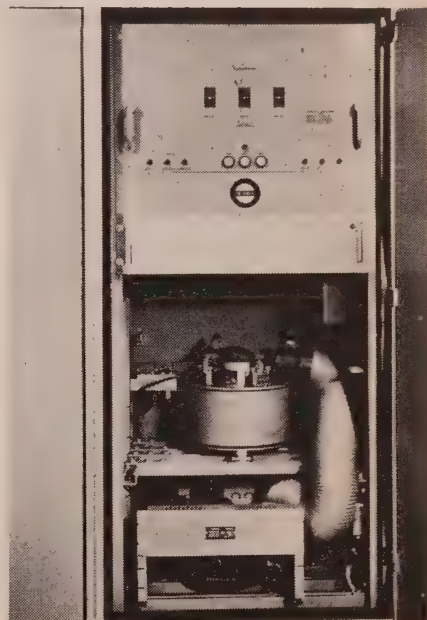
Despite limited financial resources, country's power system in 1965 will have more than ten times the capacity it had in 1948.

Cupro-Nickel Sheathing Prevents Marine Borer Attack—Triple Pole Life Expected 68

Company hopes to eliminate frequent replacement and considerable expense with protective scheme.
By P. B. Ross, Wilmington District Engineer, Carolina Power & Light Company, and D. B. Anderson, Kure Beach-Harbor Island Testing Stations, The International Nickel Co., Inc.

MANUFACTURERS / PRODUCTS

| | |
|--|-----|
| New Product And New Literature Briefs..... | 83 |
| Manufacturer's Developments | 90 |
| New Product Design | 94 |
| Supply Facilities | 101 |
| Men Of Power | 103 |
| Letters To The Editor..... | 105 |
| Calendar Of Events | 108 |
| Index To Advertisers And Their Agencies..... | 108 |



Computer cabinet showing the drum memory unit for control of automated generating units 3 and 4 of Huntington Beach station.



Carolina Power & Light Company hopes to win long bout with marine borers by sheathing poles in marine locations with non-corrosive metal.

BPA Business Publication Audit of Circulation, Inc.

Society of Business Magazine Editors



NBP National Business Publications, Inc.

READERSHIP Eastman Research The Eastman Research Organizations, Inc.

In Transformer Rebuilding . . .

Specify Wagner Form W Replacement Assemblies for full NEMA Standard Cores and Coils with new low impedance and lower core losses.

Rebuild your own transformers? Send your rebuilds out? Regardless...it pays to specify Wagner Form W Replacement Core and Coil Assemblies. Do it, and get full NEMA Standard elements, exactly like those used in new Wagner Transformers.

You get the advantages of lower impedance values, better regulation and lower losses. You get the most out of up-rating,

It's the **CORE & COILS** *that count*

too. In sizes through 15 kva, you can install the largest cores and coils that will fit your tank, and still remain within NEMA temperature rise standards.

Wagner Replacement Assemblies, in ratings from 5 through 167 kva, come to you ready to install. They have been fully tested, vacuum-treated and dried, and are packaged in transformer oil for complete protection. Universal mounting brackets are included with each unit, 25 kva and smaller.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

Wagner Electric Corporation

6424 PLYMOUTH AVE., ST. LOUIS 33, MO.

WR60-6

SERVING 2 GREAT GROWTH INDUSTRIES — ELECTRICAL • AUTOMOTIVE



LIGHT and POWER lines

Adequate Street And Highway Lighting Is Not An extravagance—This enlightened viewpoint was expressed recently by Mrs. Omar Ranney, special representative of the Highway Safety Lighting Bureau. She is addressing 2000 delegates and visitors attending the 69th annual meeting of the General Federation of Women's Clubs.

While conceding that the cost of street lighting is only one problem faced by city officials who must also worry about such things as sewers, street paving, and recreation facilities, Mrs. Ranney made this important point: "If the streets of the entire United States were dressed with modern, adequate lighting and the cost distributed among the population, it would amount to the price of a modest restaurant meal per year, per individual."

Appealing for the interest and support of the General Federation of Women's Clubs in solving the problem of inadequate street and highway lighting, Mrs. Ranney said "Your action can be a death-blow to the octopus-like hold of street crime and accidents on the United States. We believe you will feel as we do that this is the highest kind of public service the Federation can render."

As most of the nation is well aware, a dramatic example of what can be accomplished occurred in Cleveland several years ago. Action by this city's Federation of Women's Clubs was triggered by the sex murder of an 8-year-old girl on a darkened residential street on New Year's night. The program started by the Cleveland Club, which resulted in adequate street and highway lighting for their city, offers a pattern other groups can follow.

Opportunely, *Reader's Digest* will award a \$500 first prize and five \$100 runner-up prizes to those local clubs of the General Federation of Women's Clubs

which initiate the best community programs to improve street and highway lighting during the 12-month period following June 1960. Prizes will be presented at the Federation's 70th annual meeting.

Clearly this is an opportunity for the women of our nation to bring their "not to be underestimated" influence to bear on one of our most acute problems—that of eliminating the shadows and darkness that now shield the perpetrators of rape, murder, and robbery.

Customer Demand Is The Only Lasting Source Of Employment Security—Union and management negotiators at many bargaining tables are again seeking alleviation of one of the most difficult problems of our free society. It is the problem of how to eliminate unemployment and insecurity in an economy which preserves individual freedom to choose between competing offerings—in an economy in which the free customer by his often-unpredictable actions can make or break companies, and create or destroy jobs.

This enigma constitutes an enormous headache for the General Electric Company in its collective bargaining with more than 100 unions. Since this problem plagues every segment of our industry to some degree, it seems pertinent to observe some of G-E's views on the complexities of employment insecurity. These views have resulted from a great deal of intensive research in the field of union and management relations.

The important point is made that the relatively high levels of consumer spendable income has made an ever-greater share of total consumer spending discretionary or optional. While consumers have had steadily more money to spend, they have also had a wider choice of goods and services to spend it on, plus the option of not spending it at all.

Also emphasized is the fundamental consideration that neither G-E nor any other company has the unilateral power to make jobs secure. As long as customers are free to withhold or shift their business, the only way to attain lasting employment security is to please the customer.

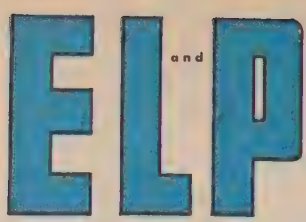
Publisher and Editor



HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging



ELECTRIC LIGHT

EDITORIAL STAFF

- P. B. Garrett, Publisher and Editor**
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
Ephraim Kahn, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

- D. M. Wulf, Advertising Production**
William Howat, Circulation Manager
J. E. Corwin, Senior Vice President
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690
Frank E. Landry, Chicago Sales Manager
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432
W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

- McDonald-Thompson Co.**
SAN FRANCISCO 5—625 Market St.
EXbrook 7-5377
LOS ANGELES 5—3727 West 6th St.
Dunkirk 7-5391
HOUSTON 6—3217 Montrose Blvd.
Jackson 9-6711
DALLAS 19—2727 Oak Lawn Ave.
Lakeside 1-1266
SEATTLE 1—1008 Western Ave.
Main 3-3766
DENVER 3—620 Sherman St.
Keystone 4-4669
PORTLAND 4—404 Times Building
Capitol 2-5146

Vol. 38 Contents for October 15, 1960 No. 20

| | |
|----------------------------|---|
| Light And Power Lines..... | 3 |
| News In Perspective | 7 |

MANAGEMENT / MARKETING

| | |
|---|----|
| Management And Marketing Developments..... | 43 |
| Nuclear News | 45 |
| Marketing Guideposts | 46 |
| Regulatory Review | 47 |
| Washington Outlook | 49 |
| Revamped System Eliminates 100 Tons of Records At KCP&L | 51 |

Seventy-five percent of 79-year accumulation, occupying most of nine-story warehouse, is thrown out; remainder fits into one-story general office.

By E. G. Freisinger, Superintendent of Reports and General Records, Controller's Office, Kansas City Power & Light Company

ENGINEERING / OPERATION

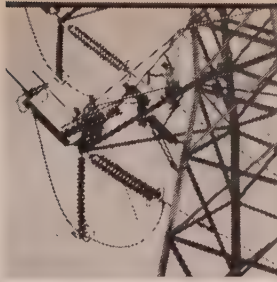
| | |
|--|----|
| Engineering/Operations Briefs | 53 |
| Directly-Buried Cables Cooled By Water—Capacity Up 50% | 54 |

Circulating water in pipes adjacent to direct-buried cable, economics permitting, can greatly increase cable's load capability.

By P. Ralston and G. H. West, The Hydro-Electric Power Commission of Ontario

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75c per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

POWER



OUR COVER

Hot-line maintenance at 345 kv is commonplace with AEP, but every precaution is taken to assure safety; here, linemen replace broken insulator with conductors still energized.

How AEP Maintains 345-kv Live Lines..... 58

EHV live-line work is commonplace with AEP but hazards are met with adequate equipment and every precaution available.

By W. Price Carter, System Transmission Line Superintendent, Appalachian Power Company

Electric Power By Unconventional Methods Of Energy Conversion..... 60

Interest in methods for missile and space vehicle power-supply requirements and developments in those areas have rekindled hopes for bulk power generation.

By P. E. Benner, A. G. Mellor, and J. B. McClure, Power Generation Engineering, Electric Utility Engineering, General Electric Company

Determination Of Optimum Conductor Size..... 66

A method that takes into account all known factors, including future requirements.

By R. A. Dewberry, Distribution Engineer, Montana-Dakota Utilities Co.

Distribution System Improvements Reduce Storm Damage, Expedite Restoration..... 69

Higher standards, stepped-up inspection and preventive maintenance pay off in improved continuity, fair weather or foul.

Utility Man's Notebook..... 72

MANUFACTURERS / PRODUCTS

New Product And New Literature Briefs..... 97

Manufacturer's Developments..... 99

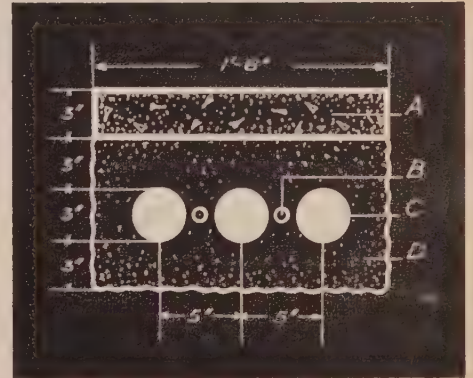
New Product Design..... 102

Supply Facilities..... 108

Men Of Power..... 110

Calendar Of Events..... 114

Index To Advertisers And Their Agencies..... 114



Water cooling greatly increases load capability of directly-buried transmission cable.



Lessons learned from previous storm damage lead to revamping system for improved continuity, faster recovery.

BPA Business Publication
Audit of Circulation, Inc.



Society of Business
Magazine Editors



National Business
Publications, Inc.

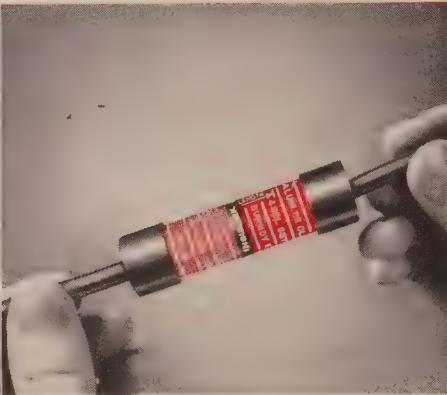


The Eastman Research
Organizations, Inc.

Quick... Easy... Sure



STRIP back cable insulation...arrows on INSULINK show how far.



INSERT wire ends; caps grip and hold cable, both hands are free for crimping.



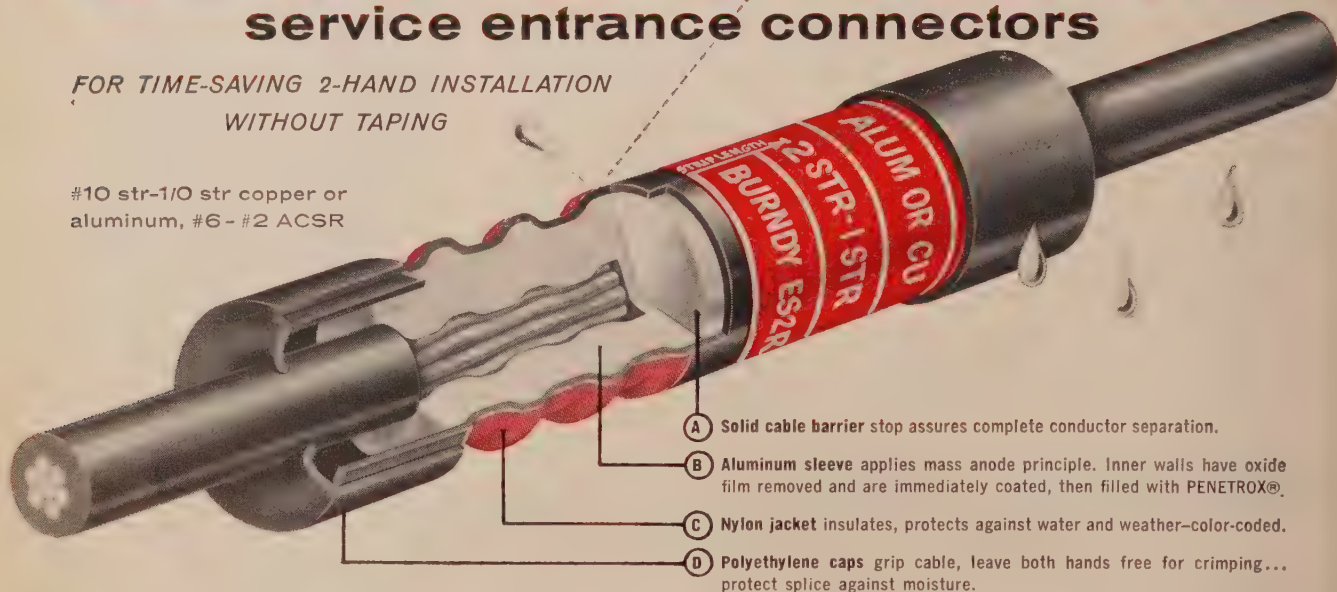
CRIMP with standard compression tool... guide lines on INSULINK show where.

Pre-insulated INSULINK[®] service entrance connectors

Patented Other Patents Pending

FOR TIME-SAVING 2-HAND INSTALLATION
WITHOUT TAPING

#10 str-1/O str copper or
aluminum, #6- #2 ACSR



Connect service entrances with much less effort, in less time, **without taping**. INSULINK pre-insulated compression connectors are installed in three simple steps with the same crimping tools and dies used to install uninsulated connectors...for time-saving economy...for neat, fully protected, electrically stable connections. INSULINK connections are

QUICK: because there's no taping.

EASY: color-coded connector jacket clearly marked to show cable ranges, strip length, where to crimp. Just strip...insert...crimp; caps hold cable ends in place for simple two-hand installation.

SAFE: fully insulated to protect personnel; protected against water and weather; neat, attractive appearance.

Get the full story on **INSULINK** pre-insulated connectors from

BURNDY

Norwalk, Connect.

In Europe: Antwerp, Belgium

Toronto, Canada

59-6

Electric Light and Power, October 15, 1960



LIGHT and POWER lines

Youngsters Given Opportunity To Tour Power Stations At Most Impressionable Age—Plant tours conducted by electric-utility organizations may be "old hat" to many people but not to youngsters about ready to enter high school. To them it is an exciting experience and one that makes a lasting impression. Thus when they become customers of the utility a few years later it is a good bet they will have at least some understanding of how electricity is generated, plus a better appreciation of the services the utility provides. Moreover, many of these youngsters can supply their parents with information which helps create a better understanding of the utility.

These were the potential benefits which encouraged the Illinois Power Company to inaugurate such a program last Fall. Results for the first year are now in. They have proved so valuable that the Company has placed the program on a continuing annual basis.

Grade schools in the Company's service area are contacted each year and invited to send either their seventh-grade or eighth-grade class to visit one of the company's four major generating stations. They are also allowed to plan additional trips in conjunction with appropriate study topics. This is an advantage, for example, to teachers of science and electricity.

During the 1959-60 school year, 6118 students from 25 schools toured the Company's four plants. They were accompanied by 253 teachers and, in some cases, parents of the youngsters.

In addition, plant personnel were hosts to other student and adult groups, boosting the total number of visitors above 6500.

To date, 94 schools have scheduled to send 5784 students on the tours this Fall and next Spring.

The average group making the tour this past school year consisted of 48.6 students and two teachers. Cost for box lunches—the major direct expenditure in the program—was about \$5906, or close to 80¢ per individual.

Illinois Power is deriving benefits from the program outside the realm of public relations. A number of their service-area people who serve as guides get a chance to make annual visits to the Company's plants and renew acquaintances with power production. These employees not only know more about plant operation now, they also have a better appreciation of the problems and accomplishments of teachers in their communities.

All-in-all, it is a big dividend on a modest investment.

Re-survey Indicates Pickup In Utility Construction In Last Quarter Of 1960—Many of our industry suppliers have had good reason to feel for some time that this year's utility construction program is falling far short of budgeted expenditures for the industry as a whole.

Findings from a recent EL&P re-survey did disclose a slackened pace during about the first seven months of the year. However, accelerated expenditures were also evidenced for the balance of the year, resulting in over-all expenditures very close to budgeted totals.

A very sizeable segment of the industry was included in this sampling of construction activities. Included were 102 utilities with composite construction budgets totalling over \$2.8-billion. Budget revisions for this group showed an over-all decrease of only 2.9 percent for this year.

Most importantly for the suppliers, this checkup showed that expenditures for new construction by this representative group of utilities during the last five months of this year should just about equal their expenditures during the first seven months.

This is just a foretaste of what the next few years will bring if our industry is to really get started on the tremendous expansion EEI's recent studies indicated must come if it is to be ready for the demands of 1960-1980.

Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
John T. Tyner, Associate Editor
R. C. Blatt, Eastern Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
Ephraim Kahn, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
J. J. Schiavo, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
J. E. Corwin, Senior Vice President
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Frank E. Landry, Chicago Sales Manager
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
EXbrook 7-5377

LOS ANGELES 5—3727 West 6th St.
Dunkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
Jackson 9-6711

DALLAS 19—2727 Oak Lawn Ave.
Lakeside 1-1266

SEATTLE 1—1008 Western Ave.
MAIN 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
Capitol 2-5146

Vol. 38 Contents for November 15, 1960 No. 22

Light And Power Lines..... 3

News In Perspective 7

MANAGEMENT / MARKETING

Management And Marketing Developments..... 63

Nuclear News 67

Washington Outlook 69

Mechanization Speeds Customer Service 70

Punched-card processing and pushbutton files make individual files instantly available.

By Allen B. Wilson, Assistant Treasurer,
Georgia Power Company

Marketing Guideposts 72

ENGINEERING / OPERATION

Engineering/Operations Briefs 73

Distribution Line Maintenance Program
Proves Effective 74

Comprehensive and continuing program has resulted in elimination of pole failures and appreciable reduction in outages.

By Robert L. Ware, Manager, Transmission and Distribution
Department, Virginia Electric and Power Company

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75c per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960

POWER



OUR COVER

Truck mounted cranes equipped with slings do effective job of moving high voltage pipe-type cable on Potomac Electric Power system as highway project makes relocation necessary.

Vibration Problems Plague Rural Lines..... 78

Causes and effects of aeolian vibration and galloping of rural lines and remedial actions taken in a number of failure cases.

By J. C. Poffenberger, Assistant Director, Research and Engineering, Preformed Line Products Company

Ultrasonic Cleaning Brightens Street Light Globes..... 84

Mobile cleaning unit makes maintenance servicing faster, quality of job better.

How PEPCO Moved Two 69-kv Pipe-Type Cables..... 86

By straightening profile of cables, slack makes move possible without altering facilities.

By Arthur Gandy, Jr., Conduit Engineer, Potomac Electric Power Company

Industry In Conference..... 89

Reports of the Rocky Mountain Electric League's Annual Convention; National Power Conference; PEA System Planning Committee Meeting; Indiana Electric Association's Annual Convention; EEI Transmission and Distribution Committee Meeting; and the National Electrical Farm Power Conference.



Program of replacing bolted connectors with compression connectors contributes materially to reduction in line outages on VEPCo's distribution system.

MANUFACTURERS / PRODUCTS

New Product And New Literature Briefs..... 109

Manufacturer's Developments..... 111

New Product Design..... 114

Men Of Power..... 122

Supply Facilities..... 126

Calendar Of Events..... 128

Index To Advertisers And Their Agencies..... 128

Improved efficiency in handling customer service and index records as a result of mechanization at Georgia Power Company is expected to pay for new system in three years or less.



PA Business Publication
Audit of Circulation, Inc.



Member: Atomic
Industrial Forum



Society of Business
Magazine Editors



National Business
Publications, Inc.



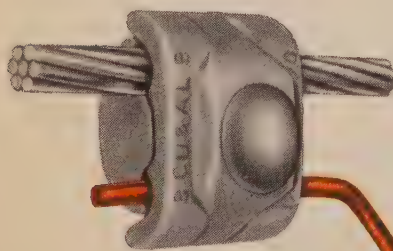
The Eastman Research
Organizations, Inc.

STRIPSEAL

seals in oxide-inhibiting **PENETROX**[®]
...on the connector contact surfaces



No Cutting...No Snipping or Ripping...Just a Gentle Pull



TAPIT[®] with STRIPSEAL makes neat, clean aluminum-to-copper connections.

and your Burndy STRIPSEALED connector is ready to make a trouble-free aluminum connection. STRIPSEAL, the leak-proof, all-weather, plastic cover hugs the connector like a "cocoon"...seals in oxide-inhibiting PENETROX—on the contact surfaces, where it belongs. **It's easy to use**...even with work gloves on. **It's clean**...just dry brush conductor and install the connector; no on-the-job application of oxide inhibitor needed. **It's sure**...lineman can't forget PENETROX. For positive protection of every connection, specify Burndy connectors with STRIPSEAL. Write for full details.

BURNDY



LIGHT and POWER lines

Capture Their Interest And See What High School Students Can Build!

—Is it possible that high school students would or could design and build an 8000-word digital computer on their own time without receiving any school credit for it? It has been done! It all started when D. M. Boyd, Jr., an engineer associated with the Universal Oil Products Company, visited the high school in his home town of Hinsdale, Illinois, to see what was being done in the way of science education. His visit was prompted by a talk given by Dean John R. Dunning of the Columbia University School of Engineering comparing Soviet and American high school scientific education.

Finding that Hinsdale High had a strong science program, Mr. Boyd volunteered to donate some equipment for a ham radio club. When several lads came to his home to pick up the equipment, they somehow started on a discussion of digital computers. Exciting considerable interest in Mr. Boyd's explanation of some of the principles of operation of such a device, they started working out a few of the basic circuits. A short time later, using relays given them by Mr. Boyd, they were able to try out their circuits. From this simple beginning there developed a project that snowballed into an 8000-word transistorized digital computer with the possibility of 128 commands. Truly a remarkable machine in any league almost unbelievable to have been designed and built by high school students. All of this took place in Mr. Boyd's basement on the students' own time, with no thought of school credit.

Shortly after the boys built their relay adder, Panellit Incorporated donated some surplus relays and Panalarm units. These were then incorporated into subtracting units, shift registers and memory units. At the end of a year and a half, the boys had a relay computer taking shape with a 15-word capacity and a word length of ten bits.

Then Bryant Computer Products became interested and donated a magnetic drum which completely revolutionized the project. A short time later Hoffman Semiconductor Division donated 2000 silicon diodes, Panellit donated a Flexowriter and Daystrom Systems donated 200 transistors. Still later, Raytheon donated 500 transistors and 1000 more diodes. International Resistance Company donated 10,000 resistors and Gulton Industries donated 1500 ceramic condensers. A final contribution of 2500 additional silicone diodes and 600 more transistors by the Texas Instruments Company insured completion of the project.

Westinghouse contributed power rectifiers for the project, the Heath Company donated an oscilloscope kit and power supply kit, and miscellaneous other items were contributed by a number of other firms.

During the summer of 1959 the boys worked in Mr. Boyd's basement almost every day for six weeks, sometimes staying until 11 or 12 o'clock at night. Further rapid progress was achieved during the Christmas holidays.

Now Bell & Howell's CEC Division has contributed a 14-channel magnetic tape recorder and Victor Adding Machine Company has donated an actual truck load of miscellaneous equipment.

Thus this has become a contributing project and a mecca for scientifically-minded students.

Such wholehearted support of this unique project by so many companies is deserving of high commendation. It also is a dramatic demonstration of the tremendous interest these companies have in encouraging students to make a start at the high school level to equip themselves for scientific careers.

If enough people in our industry will make it their business to stimulate and foster somewhat comparable scientific endeavors for high school students in their own home towns, we should see a material increase in the number of students who elect to pursue a scientific career. This has become an all-important consideration for our entire nation.

Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
R. C. Blatt, Eastern Editor
John T. Tyner, Associate Technical Editor
E. G. Enabnit, Jr., Associate Technical Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
Ephraim Kahn, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
John Beck, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
J. E. Corwin, Senior Vice President
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690
Frank E. Landry, Chicago Sales Manager
Donald R. Crane
NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432
W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy
CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505
Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.
SAN FRANCISCO 5—625 Market St.
EXbrook 7-5377
LOS ANGELES 5—3727 West 6th St.
DUNKIRK 7-5391
HOUSTON 6—3217 Montrose Blvd.
JACKSON 9-6711
DALLAS 19—2727 Oak Lawn Ave.
LAKESIDE 1-1266
SEATTLE 1—1008 Western Ave.
MAIN 3-3766
DENVER 3—620 Sherman St.
KEYSTONE 4-4669
PORTLAND 4—404 Times Building
CAPITOL 2-5146

Vol. 38

Contents for December 1, 1960

No. 23

Light And Power Lines..... 3

News In Perspective 7

MANAGEMENT / MARKETING

Management And Marketing Developments..... 21

Regulatory Review 30

Washington Outlook 31

Nuclear News 33

Economic Outlook 34

Planning Utility Office Space To Meet Future Needs..... 35

Office efficiency depends greatly on careful analysis and allocation of space.

By Walter C. Jacobs, President, S.U.A., Incorporated

ENGINEERING / OPERATION

Engineering/Operations Briefs..... 41

13-Kv Versus 4-Kv Distribution—Which Is Best?..... 42

Higher voltage becomes advantageous to supply new large loads and fringe area distribution.

By F. G. Josberger, Manager Distribution Engineering, Meters, Office and Staff Services, Long Island Lighting Company

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—\$7.00 per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960

OUR COVER

Booming summer-home developments around Clear Lake, located approximately 100 miles north of San Francisco, keep Pacific Gas & Electric Company crews busy. Here PG&E lineman John Crone replaces a transformer fuse as the lake glimmers in the morning sun.



POWER

Pressure Filling Process Does Better Pothead Job.....46

Detroit Edison has gone far towards solving the void problem caused by incomplete filling of low-voltage potheads.

By Arthur Godoshian, Engineer-Cable Performance and Roland Henderson, Engineer-Underground, The Detroit Edison Company

One Approach To Logging Of Steam-Station Performance48

Automatic monitoring equipment tests potential of manpower economy and records thermal efficiencies resulting in better loading of units.

By S. A. Lyon, System Results Engineer, Mechanical Engineering Department, New York State Electric & Gas Corporation

Overhead Line Labor Distribution, The Easy Way.....52

Line Foremen relieved of some paper-work; accounting office assigns maintenance and distribution charges based on records of past job orders at PGE Co.

By R. P. Colton, Internal Auditor, Portland General Electric Company

Industry In Conference.....58

Reports of the Iowa Utilities Annual Management Conference, AIEE Fall General Meeting, and the IAEL Annual Conference.

Utility Man's Notebook65

MANUFACTURERS / PRODUCTS

New Product/New Literature Briefs77

Manufacturer's Developments79

New Product Design84

Supply Facilities87

Men Of Power.....89

Calendar Of Events.....94

Index To Advertisers And Their Agencies.....94



Pothead with pressure filling kit used by The Detroit Edison Company.



Typical 13-kv urban distribution on joint occupancy poles at Long Island Lighting Company.



Business Publication
Audit of Circulation, Inc.



Society of Business
Magazine Editors



Member: Atomic
Industrial Forum



National Business
Publications, Inc.



The Eastman Research
Organizations, Inc.

here it is! A REAL **ONE-HAND TOOL**

installs

INSULINK® and LINKIT®

one crimp per end!

You'll like this ONE-HAND TOOL ... from start to finish, you can really work it with only ONE HAND. You can close it with less than a 50 lbs. squeeze; it weighs only 2½ lbs. and is only 12" long. You couldn't ask for an easier service tool ... it's the only *real* ONE-HAND TOOL.

Position the OH25 once ... and only once ... on each side of the INSULINK or uninsulated LINKIT. It has a new die that crimps the entire contact area at one time. You don't have to reposition, you can't overlap crimps, and you never make less than the proper number of crimps.

And, it takes only ONE CRIMP PER END ... a series of easy, ratchet controlled strokes to make a perfect crimp every time. The new dies cause the conductor strands to rub together, removing the oxide film for more stable, low resistance connections.



Insert stripped wire ends into INSULINK; caps grip and hold conductors.



Get up close to your work. Position ONE-HAND TOOL on INSULINK only once per crimp.



A series of easy strokes complete the crimp. Dies produce oxidizing wiping action between conductor strands.

ANOTHER MAJOR DEVELOPMENT IN THE

BURNDY

COMPRESSION PROGRAM



LIGHT and POWER lines

An Experiment In All-Electric Rural Living—The home is a \$40,000 all-electric tri-level home in a rural area of Ohio, occupied by a guinea-pig family of four. The objective of the experiment is to accurately record over a two-year period the kilowatthour usage by the water pump and garbage disposer, water heater, exterior lighting, range and appliance center, automatic clothes washer and dryer, heat pump and air conditioner, refrigerator, freezer, interior lighting and baseboard electric heating. Nine watt-hour meters monitor these circuits, recording both energy and demand.

In this unique case the experimenter is the Lorain-Medina Rural Electric Co-operative in Wellington, Ohio, which serves about 5200 members. Its research project is intended to provide its members with a cost guide for varying power usages in the home.

This experimental home also depends on electric power for its workshop, an intercom system, humidifier, incinerator, and electric septic tank. The latter is both an aerator and an agitator. Operated automatically, it never needs cleaning.

At each of the four corners of the house are double security lights with an independent power supply. The driveway is illuminated by four mushroom lights.

The home is of the pre-cut variety. Interior work is supervised by a master carpenter and the Co-op manager, Karl B. Crawford. The woodworking force is a part of the training group of the Co-operative. Each year five or more high school graduates are employed, three of them at least must have made arrangements to enter college. The remaining part of the group become the apprentices for the Co-op. Thus the Co-op recruits labor from the area and all are young men. Also the program is a part of the Co-op's member educational program. For the summer's work, each boy receives at least \$600 for his labor, toward his college expenses.

It is interesting that over 3800 visited the home the

first 30 days it was shown to the public, and at the annual meeting on August first 1200 members visited the home. Visitors to date total nearly 6000.

On a group basis, 33 groups not included in the above have had personally conducted tours.

Air conditioning for the month of August with all the people going through the home cost less than 15 dollars on the Co-op's 1½¢ rate. Baseboard heating for the month of September was less than ten dollars.

This commendable experimental endeavor should provide valuable operating-cost data for not only the Co-op members immediately concerned but for our entire industry.

A Notable Achievement In Safe Operations—A salute is due all employees of the Design and Construction and the General Plant Divisions of the Los Angeles Department of Water and Power for their safety records for the fiscal year ended June 30, 1960.

In that period their accident frequency reached an all-time low of 0.62 for the Design and Construction Division and 2.32 for the General Plant Division in on-the-job, lost-time industrial accidents.

This was a 98.7 percent reduction for the Design and Construction Division and a 94.2 percent reduction for the General Plant Division from that of 14 years ago.

Using National Safety Council average costs for industrial accidents, Clayton M. Allen, Engineer in Charge of the General Plant Division, and E. L. Kanouse, Engineer of Design and Construction, have calculated that over the past 14 years these employees have saved the Department \$4.4-million, thereby making this important sum available for productive use.

Congratulations to these accident-prevention "pros"!

Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP

ELECTRIC LIGHT

EDITORIAL STAFF

P. B. Garrett, Publisher and Editor
N. H. Jacobson, Executive Business Editor
K. S. Jacobs, Managing Editor
R. C. Blatt, Eastern Editor
John T. Tyner, Associate Technical Editor
E. G. Enabnit, Jr., Associate Technical Editor
R. A. Lincicome, Associate Business Editor
R. O. McGougan, Western News Editor
Ralph Elliott, Washington Editor
Ephraim Kahn, Washington Correspondent
A. C. Farmer, Economic Consultant
Edward Gordon, MBA, Research Director
John Beck, Art Director

BUSINESS STAFF

D. M. Wulf, Advertising Production
William Howat, Circulation Manager
J. E. Corwin, Senior Vice President
Marshall Haywood, Jr., President

BUSINESS OFFICES

CHICAGO 2—6 N. Michigan Ave.
Central 6-3690

Frank E. Landry, Chicago Sales Manager
Donald R. Crane

NEW YORK 17—369 Lexington Ave.
Murray Hill 3-8432

W. A. Clabault, Vice President and Eastern Manager
D. M. McCarthy

CLEVELAND 15—1836 Euclid Ave.
Prospect 1-0505

Orrin Eames, Vice President, Cleveland Manager

WEST COAST REPRESENTATIVE

McDonald-Thompson Co.

SAN FRANCISCO 5—625 Market St.
EXbrook 7-5377

LOS ANGELES 5—3727 West 6th St.
DUnkirk 7-5391

HOUSTON 6—3217 Montrose Blvd.
JACKSON 9-6711

DALLAS 19—2727 Oak Lawn Ave.
LAkeside 1-1266

SEATTLE 1—1008 Western Ave.
MAIn 3-3766

DENVER 3—620 Sherman St.
KEystone 4-4669

PORTLAND 4—404 Times Building
CApitol 2-5146

Vol. 38

Contents for December 15, 1960

No. 24

Light And Power Lines..... 3

News In Perspective..... 7

MANAGEMENT / MARKETING

Management And Marketing Developments..... 43

Guideposts..... 48

Nuclear News..... 49

Washington Outlook..... 50

Sales Training Refresher Pays Off at NOPSI..... 51

Retraining program for commercial sales representatives reaps harvest of leads for lighting and other commercial equipment.

By W. B. Nourse, Supervisor Sales Planning and Training,
New Orleans Public Service, Inc.

ENGINEERING / OPERATION

Engineering/Operations Briefs..... 55

America's First Kilowatt Turnpike Operating
At 460-Kv..... 56

PENELEC and 12 major manufacturers, 2 construction companies make history in completing EHV line.

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—\$10.00 per year; other domestic subscribers—75¢ per single copy or \$15.00 per year; Canadian and foreign subscribers—\$1.50 per single copy or \$20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

Copyright by Haywood Publishing Company of Illinois, 1960



OUR COVER

Extensive testing program begins as construction is completed on PENELEC'S 460-kv line. (See page 56 for the story on this important EHV line.)

Live-Line Maintenance With Bare Hands Cuts Man-Hours And Hazard..... 62

Linemen work on hot-lines while standing on a mat that is at the same potential as the lines.

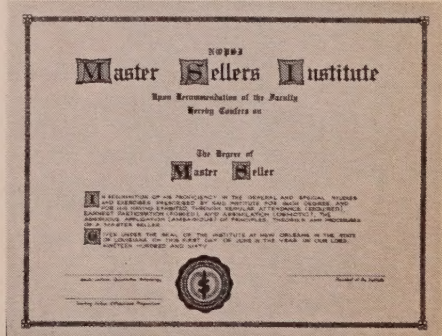
Puerto Rican Plant Tries ADP System..... 66

Automatic data processing system looks feasible for the new Palo Seco Steam Plant at San Juan, Puerto Rico.

By R. R. Ramirez, Assistant Director for Power Operations, M. Iriarte, Jr., Electrical Planning Engineer, Puerto Rico Water Resources Authority, and R. R. Tressler, Principal Engineer, Control and Instrumentation Section, Jackson & Moreland, Inc., Engineers.

Industry In Conference..... 71

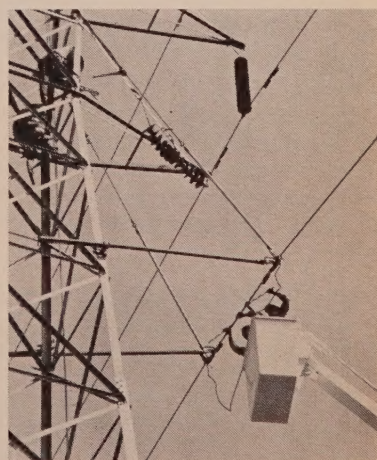
Reports of Southeastern Electric Exchange Engineering and Operating Meeting and the Pennsylvania Electric Association T & D Meeting



2—Master Seller Diplomas are awarded at New Orleans Public Service, Inc.

MANUFACTURERS / PRODUCTS

| | |
|---|-----|
| Manufacturer's Developments | 89 |
| New Product Design..... | 91 |
| New Product/New Literature Briefs..... | 93 |
| Men Of Power..... | 95 |
| Annual Index Of 1960 Feature Articles And Their Authors | 97 |
| Calendar Of Events..... | 102 |
| Index To Advertisers And Their Agencies..... | 102 |



1—Linemen are installing armor rods on 138-kv hot-line with bare hands.

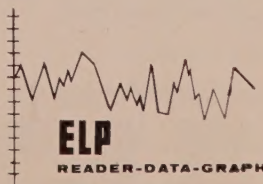
BPA Business Publication Audit of Circulation, Inc.



Society of Business Magazine Editors



Member: Atomic Industrial Forum



National Business Publications, Inc.



The Eastman Research Organizations, Inc.

here it is! A REAL **ONE-HAND TOOL**

installs

INSULINK® and LINKIT®

one crimp per end!

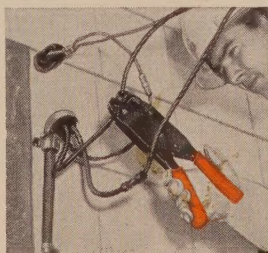
You'll like this ONE-HAND TOOL ... from start to finish, you can really work it with only ONE HAND. You can close it with less than a 50 lbs. squeeze; it weighs only 2½ lbs. and is only 12" long. You couldn't ask for an easier service tool ... it's the only *real* ONE-HAND TOOL.

Position the OH25 once ... and only once ... on each side of the INSULINK or uninsulated LINKIT. It has a new die that crimps the entire contact area at one time. You don't have to reposition, you can't overlap crimps, and you never make less than the proper number of crimps.

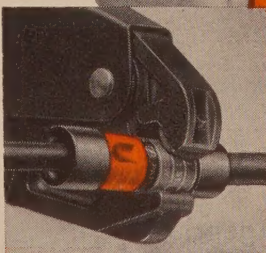
And, it takes only ONE CRIMP PER END ... a series of easy, ratchet controlled strokes to make a perfect crimp every time. The new dies cause the conductor strands to rub together, removing the oxide film for more stable, low resistance connections.



Insert stripped wire ends into INSULINK; caps grip and hold conductors.



Get up close to your work. Position ONE-HAND TOOL on INSULINK only once per crimp.



A series of easy strokes complete the crimp. Dies produce oxide removing wiping action between conductor strands.

ANOTHER MAJOR DEVELOPMENT IN THE

BURNDY

COMPRESSION PROGRAM